# BRILL'S STUDIES

# IN

# INTELLECTUAL HISTORY

# DIVINE FOREKNOWLEDGE AND HUMAN FREEDOM

*The Coherence of Theism: Omniscience*

BY

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*For*
*WILLIAM MALLORY JOHN*
*''mon fils unique''*

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# PREFACE

"One thing seems clear", writes Anthony Kenny at the close of his brilliant, little book *The God of the Philosophers*, "There is no reason why someone who is in doubt about the existence of God should not pray for help and guidance on this topic as in other matters. Some find something comic in the idea of an agnostic praying to a God whose existence he doubts. It is surely no more unreasonable than the act of a man adrift in the ocean, trapped if a cave, or stranded on a mountainside, who cries for help though he may never be heard or fires a signal which may never be seen."[1]

Upon reading these words, I was much touched by this plaintive supplication of a former theist turned agnostic, all the more so since he had been my external examiner at Birmingham. Of course, one is apt to suspect that the reader is being duped by a sort of Humean irony here; but Prof. Kenny insists that he is entirely in earnest about what he says. If so, then Christian philosophers have an obligation not to turn a deaf ear to such a cry for help, but to try to show to the best of their ability the coherence of the concept of the God whom they worship. If a sense, then, this book is for Anthony Kenny, for although I had already decided to embark on a research project on the coherence of theism when I picked up his book, it was my reading of his skeptical treatment and his prayer for help and guidance that strengthened my resolve to pursue such a project.

The importance of this project was confirmed in my thinking by the paucity of monograph-length studies on this subject and the weakness of those that do exist. For although there is an enormous and rich body of journal literature dealing with the philosophical analysis of God's attributes, there is only a handful of contemporary books on such topics, and these are generally unsatisfactory. One thinks immediately of Swinburne's *Coherence of Theism*,[2] which, though more sympathetic to theism than Kenny's book, cannot rival Kenny's profound historical scholarship and which so overextends itself that all the promissory notes for further discussion elsewhere cannot remedy this defect. There is also Ronald Nash's brief *The Concept of God*,[3] which tends to be more of a survey of contemporary opinions than an attempt to resolve the problems of the coherence of theism. Perhaps the best defense of the biblical conception of God is Stephen Davis's *Logic and the Nature of God*,[4] which argues carefully for the author's views on God's attributes, even though those views might strike one

as often unsatisfactory, in view of the contingent nature of God that emerges from Davis's treatment. Finally, although there are some book-length studies of divine attributes such as timelessness or omnipotence, until very recently the only monograph I knew of devoted to the subject of this work, omniscience, was John Moskop's *Divine Omniscience and Human Freedom*,[5] which is a short comparison of Aquinas's and Hartshorne's views on divine omniscience. But now Jonathan Kvanvig's very impressive book *The Possibility of an All-Knowing God*,[6] which appeared since the completion of this work, has greatly served to redress this situation. Although I am gratified that Kvanvig and I agree on most points, I think that the synoptic nature of my study makes it complementary to rather than reduplicative of his. At the time of my going to press, William Hasker's *God, Time, and Knowledge* has appeared, taking positions quite opposed to those defended in this study.

Like some of those mentioned above, I had initially thought to write a book dealing with the coherence of several of the principal divine attributes. Having decided to tackle the attribute of omniscience first, and in particular the problem of divine foreknowledge and future contingents, I found this subject alone so immense, so replete with philosophical ramifications elsewhere, and so fecund a source of theological and philosophical insights that for some four years I have been completely preoccupied with it. The first fruit of my research is a historical study, which serves as a companion volume to the present book, entitled *The Problem of Divine Foreknowledge and Future Contingents from Aristotle to Suarez*.[7] An adequate assessment of this problem will take one into a study of such diverse subjects as multivalent logic, the truth status of future contingent propositions, logical fatalism, tense logic, temporal necessity, backward causation, time travel, precognition, Newcomb's Problem, counterfactual logic, justification, middle knowledge, and so forth. Anthony Kenny once remarked to me that the study of Philosophy of Religion is so exciting because it impacts so many other areas of philosophical inquiry, and the study of omniscience certainly bears that out. Article-or chapter-length studies of this concept simply cannot do justice to its richness.

I offer this book as an attempt to defend the compatibility of divine foreknowledge and future contingency and to come to grips with the implications of such a view. This problem seems to me to be the most important issue raised by an analysis of divine omniscience. The other principal issue raised by a study of this attribute, namely, God's knowledge of tensed propositions, can be better discussed under the

rubric of divine immutability. Similarly, God's knowledge of necessary truths can be discussed more profitably in connection with an analysis of God's omnipotence. It is my hope that this book will help to remove one of the obstacles in the minds of some to belief in the coherence of the concept of God and thus to belief in Him.

The bulk of the research behind this book was carried out while a Visiting Scholar at the University of Arizona in Tucson and during a sabbatical spent at the Bibliothèque Nationale in Paris, and I am grateful to those institutions for the opportunity to study there. Special thanks are due once more to my wife Jan for her long hours spent at the computer typing and revising the typescript for this book.

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# INTRODUCTION

## *Coherence and Rationality*

In books of this sort some introductory word is typically said concerning the notion of "coherence" and its application to theism. Following this pattern, the question I wish to raise is whether it is rational to embrace theism even in the face of unanswerable arguments for the incoherence of theism. That is to say, if as the result of our inquiry we are forced to conclude that we are unable to find any acceptable solution to the difficulty at issue, are we compelled, if we are to remain rational, to abandon our theistic belief? This question is of no little significance, since non-theists of late are insisting that the question of the coherence of theism be raised prior to the question of grounds for theism and that should the answer to the first question be negative, then the second question becomes superfluous, since no amount of evidence can go to establish that an incoherent state of affairs obtains. I, on the other hand, wish to argue that theistic belief may be and is rational even in the face of arguments for the incoherence of theism which the theist cannot answer.

In dealing with this problem, I want to take my cue from an eighteenth century French opponent of Deism, Sylvestre Bergier, who in his *Le Déisme réfuté par lui-même* sought to turn back the attack upon Christianity by his compatriot Jean-Jacques Rousseau. In Bergier's analysis, Rousseau's objections to Christianity all rest on one fundamental axiom:[1]

> 1. God can only reveal to us and we can only believe that which is demonstrated to be true.

But at the same time, Bergier charges, Rousseau in his profession of faith affirms that he believes in God, though He is incomprehensible. Such belief is inconsistent with the above axiom:

> From this striking testimony which you render to the glory of God, one may infer a very simple argument. According to you and according to the truth, we cannot comprehend the attributes of God; yet He has revealed them to us, the Holy Scriptures publish them and extol them in a thousand places, but men never had a correct idea of them until God revealed them. God can therefore reveal to us that which we cannot comprehend. There are even many of His attributes which, it appears to us, are impossible to reconcile with one another and which seem to us contradictory: for example, the freedom of God with His immutability, His perfect unity and His immensity, His infinite goodness and His justice. Yet God has revealed them to us; it is the Scripture which instructs us

about them, and on these subjects the philosophers could only stammer.
God can therefore reveal to us that which appears contradictory, that
which revolts our reason.[2]

Since God is infinite, states Bergier, I cannot understand all His na-
ture, works, or decrees. Therefore, to refuse to believe because I
cannot understand is itself contrary to reason! To strengthen his case
Bergier appeals to the illustration of a blind man. On Rousseau's
axiom he should not believe in colors on the basis of the testimony of
others because to him they are inconceivable. It is of no help to appeal
to the distinction between things above reason versus things contrary
to reason. According to Bergier, things above reason appear to us as
contrary to reason. To a blind man a mirror is an inconceivable con-
tradiction, since the ideas of flatness and depth are contradictory to
one born blind. In the same way, many Christian truths appear con-
tradictory to us. The Trinity, for example, confesses Bergier, presents
to us palpable absurdities.[3] But since we have no clear idea of "na-
ture" or "person", we cannot say it is self-contradictory; on the basis
of revelation we know that the absurdity and contradiction are only
in appearance.

Of course, the question arises, how do we know that a purported
revelation is the Word of God? Here Bergier responds that the prin-
ciple "We can only believe that which is demonstrated to be true"
is correct in the sense of external proofs. By "external proofs" he
appears to mean argument or evidence for a conclusion, as opposed
to the analytic consistency of a concept or proposition. An appar-
ently contradictory proposition may actually be true, but to believe
in any proposition without proofs would be fanaticism and mere ob-
stinacy of faith.[4] Something may thus be incomprehensible and yet
still demonstrated to be true. Bergier presents four such methods
of demonstration: (i) A proposition may be a deduction from evi-
dent principles; for example, the attributes of God. (ii) A truth may
be guaranteed by a *sentiment intérieur*; for example, the spirituality
and freedom of the soul against materialists and determinists. (iii)
Something may be proved by empirical experience; for example, the
existence of bodies, space, and motion despite Zeno's paradoxes. (iv)
A fact may be demonstrated by external testimony; for example, the
reality of colors to a blind person. Bergier argued that by means of
the fourth method one could demonstrate the truth of the Christian
revelation.

Bergier's analysis strikes me as a very stimulating and suggestive
account of the rationality of religious belief. It seems that his dis-
agreement is not really with (1), but with

2. We can rationally believe a proposition only if we are able to demonstrate that it is not incoherent.

His attack upon (2) is thus directly relevant to our concern. His response, illustrated by the analogy of the blind man, is that in cases concerning theism, God is so far above the reach of our finite minds that it is unreasonable to expect that we should be able to comprehend Him and thus unreasonable to reject theism because of some irresolvable, alleged incoherence in the concept of God. Hence, to reject the belief

3. God foreknows future contingents

solely because this seems to one's mind impossible is itself irrational. On the one hand, Bergier's point seems to make good sense. While it is certainly irrational to believe a proposition which one knows to be incoherent, it may be rational to believe that an incoherence is apparent only, even if one cannot resolve it. Now with regard to theism, why ought we to expect that we should understand God's relation to time and space, His omnipotence, His omniscience, and so forth? Ought not the history of philosophy to teach us precisely the opposite, that centuries of reflection may be necessary to unravel certain difficult notions, such as space, time, infinity, modality, knowledge, essence, and so forth? It would seem presumptuous to declare that because we cannot comprehend (3), that proposition is therefore impossible. On the other hand, this would seem to force one to accept the rationality of any absurdity when ascribed to God, such as

4. God is absolutely good and absolutely evil.

But Bergier avoids having to accept the rationality of beliefs like (4) by going on to contend that one must have some sort of overriding reason for believing the allegedly incoherent proposition to be true. Bergier's defense would seem especially to hold good in cases in which the incoherence is implicit, not explicit, and involves complex reasoning or difficult concepts which afford a greater latitude for uncertainty. The principle which he finally means to espouse is

5. We can rationally believe a proposition, even if we are unable to demonstrate that it is not incoherent, if and only if we have good reasons for believing that proposition to be true.

Bergier would thus seem to be a theological rationalist, or in the parlance of contemporary religious epistemology, an evidentialist. But an examination of his four cases in which apparently incoherent beliefs are rational reveals that in cases (ii) and (iii) the reason for the

belief may not be another proposition from which the belief is inferred, but a set of circumstances which ground the belief as properly basic. In case (i) Bergier is undoubtedly thinking of the scholastic arguments for the existence and nature of God. If, for example, we have a valid argument for an immaterial Creator of the universe, then if the premisses of that argument are more evidently true than the premisses supporting the conclusion that an immaterial agent is incoherent, then belief in an immaterial Creator is rational even if one cannot answer the charge that an immaterial agent is impossible. But in case (ii) Bergier is not appealing to some argument or proposition to justify belief in the immateriality and freedom of the self, but to an inwardly intuited experience which grounds such beliefs even in the face of unanswerable objections from materialists and determinists. I am rational in thinking that they must be wrong because I have a properly basic belief in my own freedom and immaterial selfhood that overwhelms their arguments. Similarly in case (iii) my beliefs in the external world of material objects, in time, and in motion are not inferences from more foundational beliefs, but are grounded in certain circumstances which render them properly basic. And I am rational to continue to hold such beliefs even if I am utterly incapable answering the arguments of Bradley, McTaggart, and Zeno (some of which have, indeed, required considerable philosophical acumen to answer) that these beliefs are incoherent. Finally, in case (iv) testimony supplies the foundation for rationally accepting an apparently incoherent belief. Although Plantinga classes beliefs based on testimony as basic beliefs, in Bergier's case of the blind man, it may well be that his belief in the reliability of sighted persons is the foundation from which he consciously infers that mirrors and colors actually exist, though they be incomprehensible to him. Bergier thinks that Christian beliefs like the incarnation of Christ are based on the testimony of those who heard Jesus's teaching and saw it attested by miracles. It would be interesting to know whether Bergier would add a fifth case to his list in which experimental evidence warrants acceptance of an apparently incoherent belief. One thinks immediately of the photon, which manifests incompatible properties of a wave or a particle.

It seems to me that if we take "reasons for believing" to include the grounds for basic beliefs, Bergier has argued his case very plausibly. As Plantinga explains in a recent reply to Quinn,[5] if one is to continue to hold rationally to a belief in the face of a defeater of that belief, he must have a defeater of the defeater. But the defeater-defeater may be just the original belief itself. Plantinga gives the illustration

of my belief that I am innocent of a crime even though the external evidence is completely against me; I am rational to continue in my original belief because it itself defeats its defeaters. In such a case we may speak of an intrinsic defeater, for it defeats its defeaters without appeal to other beliefs. Now it is evident that Bergier thinks of our beliefs in cases (ii) and (iii) as being intrinsic defeaters which simply, to use Quine's term,[6] overwhelm their defeaters. Plantinga claims that theism may also be such a belief. I would contend that it is. According to the New Testament, the inner witness of the Holy Spirit supplies a person with a full assurance of the truth of his faith (Rom. 8.14-15; I Jn. 2.20, 26-7; 3.24; 4.13; 5.7-10), which entails that God exists. The witness of the Holy Spirit so grounds theistic belief that it is an intrinsic defeater of arguments lodged against its coherence. Hence, even if one cannot undercut or rebut a defeater alleging that theism is incoherent by producing an extrinsic defeater-defeater one is still rational to embrace theistic belief because he has an intrinsic defeater-defeater grounded in the witness of God Himself. Thus, it is rational to be a theist even in the face of unanswerable arguments against the coherence of theism.

Now with specific regard to divine omniscience the fact that theistic belief is an intrinsic defeater does not *prima facie* guarantee that God foreknows future contingents—one would at least have to argue that God is essentially omniscient and that it is necessary that future contingent propositions are bivalent and some are true. The former thesis is supported by the Anselmian intuition of God as a maximally great being and the latter thesis has very persuasive arguments in its favor, as we shall see. Or one could maintain that belief in God is properly basic and an intrinsic defeater, then go on to argue that one has good reasons to believe that this God has revealed Himself in Scripture. A combination of such beliefs might defeat defeaters for (3) even if one cannot rebut those defeaters. In light of the complexity of the issues involved in the foreknowledge and freedom debate, I should maintain, as suggested above, that to continue to accept (3) even in the face of arguments for its incoherence which one cannot answer is the better part of intellectual humility.

## Problems of Omniscience

According to Anthony Kenny, "The doctrine of omniscience is easy to formulate precisely: it is the doctrine that for all $p$, if $p$, then God knows that $p$."[7] Kenny's definition is more accurately a definition of

what it is for God to be omniscient, but it can be easily generalized for any agent S:

O$_1$: $S$ is omniscient $=_{df}$ For all $p$, if $p$, then $S$ knows that $p$.

Unfortunately, the situation does not appear to be as simple as Kenny asserts. For O$_1$ does not exclude $S$'s also entertaining any number of false beliefs in addition to those propositions known by $S$. It might be said that $S$'s holding only true beliefs is entailed by the definition given, since among the propositions known by $S$ is

6. All my beliefs are true.

But such a rejoinder seems question-begging, for there is no reason to take (6) as true unless omniscience entails holding no false beliefs. But if $S$ may hold false beliefs in addition to knowing all true propositions, then (6) is simply false. O$_1$, then, fails to capture what is meant by "omniscience", since, if $p$, it is possible according to this definition that $S$ knows that $p$ is true, he knows that $\sim p$ is false, he knows that $p \cdot \sim p$ is necessarily false, and yet he believes $\sim p$ as well as $p$. Hence, Kenny's definition must be revised to:

O$_2$: $S$ is omniscient $=_{df}$ For all $p$, if $p$, $S$ knows that $p$ and does not believe that $\sim p$.

Still this does not seem to settle the matter. For now questions arise as to the nature of propositions and the extent of propositional knowledge. First, are propositions tensed or must the tense of a sentence be eliminated in order to disclose the propositional content of that sentence? How one answers that question may affect one's definition of omniscience. If propositions are not tensed, then O$_2$ seems adequate so far forth. But if propositions are tensed, then certain thinkers such as Davis find O$_2$ problematic since $S$ must know, for example, both that

7. Socrates will drink hemlock

and

8. Socrates will not drink hemlock,

since the former is true before his death and the latter is true after his death.[8] But a definition which entails that $S$ knows contradictories does not express what is normally meant by "omniscience". Defenders of tenseless propositions would suggest that this difficulty be resolved by outfitting the propositions with definite temporal indexicals and tenseless verbs, so that both (7) and (8) express the same proposition

9. Socrates *drinks* hemlock in 399 B.C.

But advocates of tensed propositions maintain that (9) fails to capture the full meaning of (7) or (8), since we no longer know by (9) whether Socrates's death is a past or a future event. And analyses of the temporal "now" in terms of indefinite temporal indexicals is similarly problematic, for

10. The exams are over on June 13

does not convey the same knowledge as

11. The exams are over today!

For students do not rejoice over knowledge of (10), but they do over knowledge of (11). Hence, Davis contends that in our definition of omniscience, the truth of propositions must be relativized to a time $t$:

O₃: $S$ is omniscient $=_{df.}$ For all $p$, if $p$ at $t$, then it is true at $t$ that $S$ knows that $p$ and does not believe $\sim p$.

This definition would remain acceptable to advocates of tenseless propositions so long as they hold those propositions to be omnitemporally true. In fact, if we leave ambiguous whether the "knows" is tensed or tenseless, this definition is acceptable even to proponents of divine timelessness who hold a tenseless view of propositions.

But notice that O₂ is problematic in respect to tenses and temporal indexicals only if $S$ is timeless. For if $S$ is temporal, he may know different propositions at different times. O₂ would entail a contradiction only if it stated that $S$ knows all $p$ simultaneously; but O₂ leaves that an open question. Moreover, if $S$ is timeless, then so long as propositions are tenseless, O₂ presents no difficulty. So O₂ would be problematic only for a defender of divine timelessness who also regards propositions as tensed. But that would be a difficulty for such position, not for the definition *per se.* It seems to me, therefore, that the specifications made in O₃ are really superfluous, for O₂ does not imply that $S$ knows contradictories, since it does not state that $S$ knows all $p$ at the same time.

Secondly, do propositions contain personal indexicals or not? If they do, then God is clearly not omniscient, for He cannot know such propositions as "I earned an A- in Epistemology" or "I injured my back lifting weights". It might be rejoined that in knowing a proposition like

12. Jan is baking a cake,

God knows the same fact that Jan knows when she knows

    13. I am baking a cake

and that therefore the propositional content of these sentences is identical. But proponents of personally indexed propositions point out that knowledge of

    14. I am lying in hospital

is quite something else than knowledge of

    15. Robert Jenkins is lying in hospital,

for if Jenkins is suffering temporary amnesia as result of a trauma he might well know (14) to be true without knowing (15). If God is omniscient, then, He must know not only (15), but (14) as well, which is incoherent.

Such considerations, however, serve only to show that (14) and (15) express different items of knowledge; it has not been proved that the difference between knowledge of (14) over knowledge of (15) is a matter of *propositional* knowledge. According to a provocative, recent analysis by David Lewis, there is certainly a difference between knowing (14) and knowing merely (15), but the difference is a matter of non-propositional knowledge.[9] Propositional knowledge like (15) is knowledge *de dicto*, but knowledge *de se* is non-propositional knowledge arising from the self-ascription of properties. If Lewis is correct, then God may be correctly characterized by $O_2$ as omniscient, without thereby implying that He has all (non-propositional) knowledge. Indeed, this same solution could serve to resolve the first problem mentioned above. For while knowledge of (9) or (10) does not imply knowledge of (7) or (11) respectively, it might be contended that the difference between knowing (7) or (11) over merely knowing (9) or (10) is a matter of non-propositional knowledge due to self-ascription of properties. This would avoid the awkward circumstance of having to say that when $S$ comes to know, for example,

    16. The exams were over yesterday,

he has lost some of his propositional knowledge, namely (11). Lewis's account would preserve God's omniscience defined in terms of propositional knowledge without necessarily impacting His eternity or immutability—though if one placed God in time, His immutability would be affected, since His *de se* knowledge would be changing.

Or, alternatively, one might adopt Kvanvig's very recently proposed solution that belief involves a triadic, not a dyadic, relation: in

addition to the particular intentional attitude and the object of belief, there is also the way in which the propositional object is accessed.[10] One can directly and immediately grasp only propositions implying one's individual essence; all other propositions are indirectly grasped. Thus, the propositions expressed by (12) and (13) are identical, but Jan grasps this proposition immediately and directly whereas anyone else, say, God, grasps it indirectly. The meanings of sentences (12) and (13) are different, as is clear from the grammatical person of the sentences, and serve as the way through which the identical proposition is differently accessed. The same analysis serves to handle tensed sentences with indefinite temporal or spatial indexicals. Propositions are tenseless and equipped with definite dates and place names, but are differently accessed by persons in different spatio-temporal locations. Hence, for example, (10) and (11) express the same proposition, but that proposition is expressed in sentences having different meanings, which serve as the way different spatio-temporal persons grasp them. On Kvanvig's analysis, omniscience does not entail any difficulties for God's eternity or immutability if one should care to construe God as timeless, for He could timelessly know all propositions, grasping indirectly those concerning spatio-temporal items and directly grasping those concerning His own person. But once more, if one for independent reasons construed divine eternity in terms of temporal duration, then God's immutability would be affected because God would at different times grasp different propositions directly.

One very interesting consequence of both these theories is that omniscience does not serve to exhaust God's cognitive excellence. For on both views, an omniscient being might possess all propositional knowledge and yet lack awareness of himself as himself. God's cognitive excellence surpasses even omniscience, for in addition to all propositional knowledge God also possesses knowledge *de se* or, alternatively, grasps directly those propositions implying His own individual essence.

In this same vein, Charles Taliaferro charges that the typical definitions of omniscience in terms of God's propositional knowledge fail to capture the classical doctrine of omniscience, which should be understood in terms of maximal cognitive power.[11] For example, under the standard definitions of omniscience, two persons who each know the truth values of all propositions would both rank as omniscient, even if it were the case that only one of them knew such truth values immediately while the other knew them only derivatively by being

informed by the first. To avoid this awkward situation, Taliaferro proposes

> $O_4$: $X$ is omniscient $=_{df}$. It is metaphysically impossible for there to be a being with greater cognitive power than $x$, and this power is fully exercised.

Now while I should readily agree that God's cognitive excellence is by no means exhausted by the scope and accuracy of His propositional knowledge, it does not seem to me that it is therefore necessary to revise traditional definitions of omniscience. For "omniscience" (from *omni*, all + *scientia*, knowledge) means simply knowledge of all things and has no intrinsic connection with power. Hence, one may define omniscience simply in terms of the scope and accuracy of God's knowledge without prejudicing the further question of His cognitive power.

All these considerations go to show that the concept of omniscience is much more complicated than it might at first appear. I do not, however, think that these conundrums are in the end of much significance for the coherence of the biblical doctrine of divine omniscience. If either Lewis or Kvanvig's proposal succeeds, then the definition of omniscience that for all $p$, if $p$, God knows that $p$ and does not believe $\sim p$ serves to capture the biblical doctrine. If propositions do include personal indexicals, however, then the biblical theist will simply say that the biblical doctrine is not that God is, in this technical sense, omniscient, and he will exempt first-person propositions not referring to God from God's knowledge. Perhaps he will adopt some other term to express the biblical doctrine, like "maximally intelligent". In this work, I am going to assume that some solution such as Lewis's or Kvanvig's is tenable and that, therefore, the biblical theist can affirm divine omniscience as defined in $O_2$.

Throughout this brief discussion, we have assumed that omniscience ought to be defined in terms of knowledge of propositions. But some thinkers have rejected an analysis of God's omniscience in terms of His belief in or knowledge of propositions. For example, William Alston argues that since God grasps any concrete whole in its *fullness* and has no need to extend His knowledge, inferentially or otherwise, by isolating separate propositions, there is no point in carving up God's intuition of reality into separate propositions.[12] As finite knowers, we have to represent God's knowledge as knowledge of this or that particular fact, but in itself it is an undivided intuition. Alston emphasizes that such a view does not depend on any Thomistic doctrine of simplicity. If Alston's view is correct, then it

is misleading to define God's omniscience in terms of propositional knowledge, since His knowledge has no such structure. But even if God's knowledge is propositional, continues Alston, it does not follow that God has beliefs. Alston champions an intuitive conception of knowledge, according to which knowledge of a fact is simply immediate awareness of that fact. Even God's being aware of $x$ as $P$ does not imply His belief that $x$ is $P$, where that claim commits us to saying that God possesses a belief that is capable of being false; for God is infallible. Immediate awareness of facts is the highest form of knowledge and cannot therefore be denied to God.

Now while I find Alston's model of God's intuitive, non-propositional knowledge very attractive, his denial that God has beliefs seems plausible only on that model; once we grant propositional structure to God's knowledge, it seems clear that God infallibly believes each one of them—I see no reason to think that "belief" entails fallibility, as Alston seems to think. Nor does it seem to me that any advantage is to be obtained in the debate over theological fatalism by denying that God has beliefs, as Alston alleges. For even if there are no past facts consisting of God's beliefs, still there is the past fact of His intuitive awareness at $t_1$ of events that will happen at $t_2$, and the future contingent propositions of which He is aware or which we use to represent His undivided intuition are still antecedently true or false, so that the argument for fatalism may proceed as before. On the other hand, if an intuitive, non-propositional model of God's knowledge proves to be coherent,[13] then the theist may well be inclined to adopt such a model. I do not, however, think such a move would force us to jettison our traditional definitions of omniscience in terms of propositional knowledge; we need only add the proviso that such a definition expresses the human point of view: we grasp God's knowledge in propositional terms. By means of such a definition, we adequately capture the extent and infallibility of God's *de re* knowledge, though not its mode, since we represent His undivided intuition in a fragmented way. For convenience's sake, I shall in the remainder of this work speak anthropocentrically of God's knowledge as propositional.

Now unless future contingent propositions or, alternatively, tenseless propositions about future contingents, fail for some reason to be true, then an omniscient God must know all such true propositions. Here the God of the philosophers coincides with the God of Abraham, Isaac, and Jacob, for in this case at least philosophical and biblical theology are in one accord that God knows contingent

events which are future with respect to the present time.[14] Although some Christian philosophers of religion rather cavalierly deny that the Bible teaches divine foreknowledge, one suspects that such a conclusion is not derived from or supported by careful exegesis. Biblically speaking, the doctrine of divine foreknowledge is not some incidental or tangential teaching, but underlies the biblical view of history and even serves to differentiate Yahweh from all false gods (Is. 41.21-42; 44.6-8; 46.9b-10). It is a teaching of both the Old and New Testaments, and the Scriptures abound with examples of prophecies of future events. Significant for the Christian is the fact that the same sort of foreknowledge ascribed to Yahweh in the Old Testament is exhibited by Jesus in the New (Mk. 8.31; 9.30; 10.32b-4; 14.13-15, 18-20, 27-30, and parallels). God's foreknowledge encompasses the most contingent of events, even the very thoughts that a person will think (Ps. 139.1-6). It is true that there are instances in which God is said to "repent" of some action He has taken or to relent on something He had said would take place, which would seem to undermine the doctrine of foreknowledge. But a careful study of the relevant texts reveals that God's "repenting" does not mean His changing His mind, but simply "to suffer emotional pain", and that His relenting on prophesied judgements is due to a change in human behavior which renders the judgement no longer appropriate.[15] In such a case the prophecy of judgement was not a manifestation of foreknowledge but was rather a forecast or forewarning of what would, *ceteris paribus*, happen, that is, unless the persons involved repented. But while some prophecies are of the nature of mere warnings, there are plenty of instances in which genuine foreknowledge of the future is exhibited. It is also true that many prophecies could be explained as God's declaration of what He Himself would bring about or foreordain to happen, so that foreknowledge would not necessarily be involved. But while Hebrew religion had a powerful sense of God's sovereignty, it also insisted on genuine human freedom as well, and many examples of prophecy concern events brought about by human persons, not God. This is especially evident when future sinful acts of men are predicted. Reducing foreknowledge to foreordination threatens to make God the author of sin. On balance, then, the teaching of the Bible is that God possesses knowledge of future contingents, so that among the propositions encompassed by His omniscience are true propositions about future contingent events.

For Judaeo-Christian theology, this doctrine raises two important issues: (1) How is genuine contingency preserved in the face of infal-

lible divine foreknowledge of all events, and (2) how can God know true future contingent propositions? These are distinct problems, often confused, and in this book we shall extensively address each of them. In chapters 1-11 I shall consider the various alleged inconsistencies between divine foreknowledge and future contingents and then in chapters 12 and 13 the basis of God's knowledge of future contingents.

## THEOLOGICAL FATALISM

Despite the long history of its debate, the problem of fatalism, and in particular theological fatalism, has in the second half of the twentieth century rekindled the fires of philosophical controversy. A remarkable number of contemporary thinkers have argued that divine foreknowledge or the antecedent truth of future contingent propositions and human freedom are incompatible and that therefore if fatalism is to be avoided, it must be held either that God does not, strictly speaking, *fore*-know future events but knows them timelessly, or that future contingent propositions are not true or false, so that they do not fall within the purview of divine omniscience. Among their number we may reckon Prior, Pike, Geach, Helm, Lucas, Iseminger, Hasker, Purtill, Rowe, Boothe, Fischer, Taylor, Cahn, Danto, Schlesinger, and several others, who, in their discussions of related issues such as backward causation or Newcomb's Paradox, embrace knowingly or unknowingly fatalistic positions. This is a pretty impressive catalogue and in this first chapter we shall examine the arguments of two of the most prominent representatives of theological fatalism.

### A. N. Prior

In two important essays, "The Formalities of Omniscience" (1962) and "Time and Determinism" (1967), Arthur N. Prior sought to formalize and defend the argument for theological fatalism based on the necessity of the past. The great tense logician claimed to be a "grammaticist"; that is to say, he thought that while genuine metaphysical problems do exist, one has to talk about grammar a little bit in order to solve most of them.[1] Accordingly, he explains that it is a historical accident that we form the past or future tense in English by changing the verb of a sentence, rather than by adding an adverb to the sentence to indicate the tense. We could do this, for example, by saying, "It was the case that . . ." plus the present-tense sentence. This will be the convention that Prior adopts in dealing with divine foreknowledge of future contingents. "$Fp$" stands for "It will be the case that $p$," where $p$ is a present-tense proposition; similarly "$Pp$" for "It was the case that $p$." The addition of a variable before $p$ indicates how many time units from the present $p$ will be or was the case; for example,

"*Fnp*" is to be read, "It will be the case *n* time units hence that *p*."
Prior defines omniscience as the doctrine:[2]

1. It is, always has been, and always will be the case that for all
*p*, if *p* then God knows that *p*.

From this it follows that

2. If, at any time, it was the case at that time that it would be
the case that *p*, then God knew at that time that it would be
the case that *p*.

But, Prior demands, is it also true to say that

3. For all *p*, if (it is the case that) *p*, then it has always been the
case that *p*?

If so, then it follows that

4. For all *p*, if (it is the case that) *p*, God has always known that
it would be that *p*.

If (3) is true, then so is (4); and if (3) is false, (4) is also false.
For if (3) is false, then in some cases in which it is the case that *p*, it
nevertheless has not always been the case that *p* would be the case;
and if this has not always been the case, then it cannot have always
been known to be the case, whether by God or anyone else.

In order to prove that (3) is false, Prior turns to the fatalistic
argument which Aquinas discussed at length, namely the argument
based on the proposition:

5. If anything is known to God, then that thing will be.

The antecedent is necessarily true because it is past and *quod fuit,
non potest non fuisse,* (what has been cannot now not have been).
He explains,

> For what is the case already has by that very fact passed out of the realm
> of alternative possibilities into the realm of what cannot be altered. Once
> it is, that which is is-necessarily, and once it is-not, that which is-not
> necessarily-is-not, i.e. when it passes from the future into the present and
> so into the past, a thing's chance of being otherwise has disappeared.[3]

Since the antecedent is in this sense necessary, the consequent is also
necessary. Prior notes that the charge that this argument confuses
*necessitas consequentiae* with *neccessitas consequentis* is groundless,
since the proponents of this fatalistic argument "have in fact been
perfectly aware of the distinction; what they are exploiting is a certain
logical relation that does exist between the two sorts of necessity . . ,
namely that where *not only the implication as a whole, but also the
implying proposition, is necessarily true*, there the necessarily implied
proposition is necessarily true also."[4] The necessity attaching to the

consequent is a sort of temporal inevitability or unpreventability. Nor is it relevant, Prior explains, to claim that fatalism is avoided because there is no causal connection between the antecedent and consequent. The fatalist need not contend that God's foreknowledge causes the future event to occur. "It is enough that the former cannot be the case without the latter being the case, regardless of why this is so. And in fact if we like to say that it is because $x$ will be that it can be known that it will be, rather than vice versa, this means more than ever that $x$'s future coming to pass is beyond prevention, since it has already *had consequences* which its opposite could not have . . . "[5] Since the effect is given, the event cannot fail to happen. Hence, the fatalistic argument does not rest on divine foreknowledge's being the cause of the event foreknown.

Prior then formalizes this argument, leading to the  conclusion $CFpLFp$ (If $p$ will be the case, $p$ will necessarily be the case):[6]

6. $CPmpLPmp$

[If it was the case $m$ time units ago that $p$, then necessarily it was the case $m$ time units ago that $p$.]

7. $CPmF(m + n)pLPmF(m + n)p$                    (6, subst. )

[If it was the case $m$ time units ago that it would be the case $m + n$ time units thence that $p$, then necessarily it was the case $m$ time units ago that it would be the case $m + n$ time units thence that $p$.]

8. $CFnpPmF(m + n)p$

[If it will be the case $n$ time units hence that $p$, then it was the case $m$ time units ago that it would be the case $m + n$ time units thence that $p$.]

9. $CFnpLPmF(m + n)p$                            (8, 7, syll.)

[If it will be the case $n$ time units hence that $p$, then necessarily it was the case $m$ time units ago that it would be the case $m + n$ time units thence that $p$.]

10. $CLCpqCLpLq$

[If necessarily it is the case that $p \supset q$, then it is the case that necessarily $p \supset$ necessarily $q$.]

11. $LCPmF(m + n)pFnp$

[Necessarily, if it was the case $m$ time units ago that would be the case $m + n$ time units thence that $p$, then it will be the case $n$ time units hence that $p$.]

12. $CLPmF(m+n)pLFnp$                                                    (10,11)

[If necessarily it was the case $m$ time units ago that it would be the case $m+n$ time units thence that $p$, then necessarily it will be the case $n$ time units hence that $p$.]

13. $CFnpLFnp$

[If it will be the case $n$ time units hence that $p$, then necessarily it will be the case $n$ time units hence that $p$.]

It might be objected to (6) that this necessity is a "fleeting necessity" because it does not remain true that $n$ time units ago it was the case that $p$.[7] But Prior dismisses the objection as frivolous, since for any given $n$ the truth value of $Pnp$ must change with time. The point is that if it was the case that $p$, then it will always be the case that it was the case that $p$. This leads Prior to formulate the Law of Post-determination:

14. $CTaPnpDaPnp$

[If it is true at date $a$ that it was the case $n$ time units ago that $p$, it is determined at $a$ that it was the case $n$ time units ago that $p$.]

This leads in turn to an argument for universal predetermination:

15. $CFnpPmF(m+n)p$                                         (from tense logic)

[If it will be the case $n$ time units hence that $p$, then it was the case $m$ time units ago that it would be the case $m+n$ time units thence that $p$.]

16. $CTaFnpTaPmF(m+n)p$   (15, RTC; $\vdash C\alpha\beta\rightarrow \vdash CTa\alpha\ T\alpha\beta$)

[If it is true at date $a$ that it will be the case $n$ time units hence that $p$, then it is true at date $a$ that it was the case $m$ time units ago that it would be the case $m+n$ time units thence that $p$.]

17. $CTaFnpDaPmF(m+n)p$             (16, DP: CTaPnpDaPnp)

[If it is true at date $a$ that it will be the case $n$ time units hence that $p$, then it is determined at date $a$ that it was the case $m$ time units ago that it would be the case $m+n$ time units thence that $p$.]

18. $CPmF(m+n)pFnp$                                         (from tense logic)

[If it was the case $m$ time units ago that it would be the case $m+n$ time units thence that $p$, then it will be the case $n$ time units hence that $p$.]

19. $CDaPmF(m+n)pDaFnp$      (18, RDC: $\vdash C\alpha\beta\rightarrow$CDa$\alpha$ Da$\beta$)

[If it is determined at date $a$ that it was the case $m$ time units ago that it would be the case $m+n$ time units thence that $p$,

then it is determined at date $a$ that it will be the case $n$ time units hence that $p$.]

20. $CTaFnpDaFnp$                                    (17, 19 syll.)

[If it is true at date $a$ that it will be the case $n$ time units hence that $p$, then it is determined at date $a$ that it will be the case $n$ time units hence that $p$.]

Having formulated the argument, Prior then considers the Thomist and Ockhamist solutions to theological fatalism. Aquinas maintained that because God is timeless, *est scitum a Deo* means that if God knows a thing, it *is*, rather than it *will be*. But Prior, who subscribes to a dynamical view of time, cannot see how the pastness, presentness, or futurity of one event can be relative to the persons knowing it.[8] The future has an openness to alternatives which the past lacks, and this openness cannot be observer relative—either it exists or it does not. Moreover, since what was future is now and will be past, Prior cannot understand what is meant by saying future contingent events are neither future nor contingent as God sees them. Indeed, how could God see an event as present and thus beyond alteration until it is? For these reasons, Prior cannot adopt a Thomist solution.

But neither does he find the Ockhamist solution compelling.[9] According to this school, not all past-tense propositions are necessary, but only those not equivalent to future-tense propositions. Over these latter we do have the power to determine their truth-value. For example, by deciding whether or not to smoke tomorrow, I decide whether to make it to have been true yesterday that I would smoke two days later. The Ockhamist agrees that

21. $CaLPnFna$
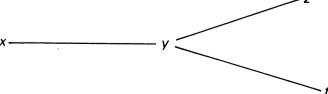
(e.g., If I am now smoking, it now-unpreventably was the case this time yesterday that I would be smoking a day later.)

But he would deny

22. $CaPnLFna$

(e.g., If I am now smoking, then it was the case this time yesterday that I then-unpreventably would be smoking a day later.)

According to Prior, the Ockhamist system is like a branch from left to right:

Suppose $\alpha$ is true at $z$, but false at $t$. At x there is therefore no necessary truth about the future, with regard to $\alpha$, nor at $y$ about the past with regard to $\alpha$. But Prior must acknowledge that for the Ockhamist, $\alpha$ is contingently true or false at $x$, and this makes Prior uneasy:

> I think I can attach intelligible senses to the phrases 'was *true* yesterday' and '*was the case* yesterday' which give the Occamist results; but I cannot find any such sense for 'was *known* yesterday.' I can cause a person's guess made yesterday to have been correct by my free choice tomorrow. I can also tomorrow verify a person's guess right now that the person's guess yesterday was indeed correct. But I don't see how these contingent futures or future-infected pasts can be known. The alleged knowledge would be no more than correct guessing. For there would be *ex hypothesi* nothing that could make it knowledge, no present ground for the guess's correctness which a specially penetrating person might perceive.[10]

Prior's point is not that God's knowing a future contingent proposition is in some sense a fact of the past more unalterable than $p$'s being true, hence vitiating Ockham's solution; but rather that while $p$ might be true, it still cannot be known to be true, since there is no justification for the belief that $p$. This would seem to put an entirely different complexion on Prior's reasoning, for now the issue no longer appears to be the fatalism entailed by the truth of future contingent propositions, but the unknowability of such propositions.

Nonetheless Prior proceeds to argue that such propositions are not now true or false. He distinguishes between

23. $FnNp$

(It will be the case the interval $n$ hence that [it is not the case that $p$.])

and

24. $NFnp$

(It is not the case that [it will be the case the interval $n$ hence that $p$.])

If $p$ is a contingent proposition, then we may maintain (24) without affirming (23). Prior acknowledges that this entails a denial of Excluded Middle:

> . . . I would say that we have at this stage
>
> $NAFpFNp$
>
> ('Neither it-will-be-that $p$ nor it-will-be-that *not-p*'). And this state of affairs we can alter, changing it to
>
> $AFpFNp$
>
> when it is in our power to decide one way or other and we do so.

> But what is past cannot be thus altered, for it is *always* the case
> that either *p has been* the case or not-*p* has, i.e. we always have
> *APpPNp*,
>
> and there can be no question of changing from this to its opposite
> or vice versa.[11]

In an earlier piece, Prior had asserted that the three-valued logic
of Lukasiewicz was "admirably adapted" to the handling of future
contingent propositions: the value 1 is assigned to true statements of
timeless relations, of past or present events, or of already determined
future events; 0 to such statements as are false; and $\frac{1}{2}$ to statements
about undetermined future events.[12] But *ApNp* is not one of the laws
of the the Lukasiewicz-Tarski three-valued system, for if $p = \frac{1}{2}$, *ApNp*
$= A\frac{1}{2} N\frac{1}{2} = A\frac{1}{2} \frac{1}{2} = \frac{1}{2}$. In his article on omniscience, Prior identifies
his view as Peircian, according to which system there are in a sense—
namely, the temporal sense—no contingent truths, but only necessary
truths. Nevertheless, there are contingencies, that is, matters of which
it is not yet true either that they will be the case or will not be the
case. On this view God does not know future contingencies because
"It will be the case that *p* [or '~*p*']" has no truth for God to know.[13]

Against John Lachs' charge that on such an account God would
have to be constantly learning more in order to remain omniscient,[14]
Prior rejoins that we may talk sensibly about the set of all proposi-
tions which have been true and the set which are now true and the set
of all *p* such that it is the case that it will be the case that *p*, and an
omniscient being must know which propositions are in these sets.[15]
But it would be self-contradictory to know the set of propositions
which will be true but which are not in the set of those of which "it
is the case that it will be the case that *p*". One can know only that
such a set exists, but one cannot know its members. Hence, God's
ignorance and acquisition of knowledge in this regard do not impugn
His omniscience.

In his later piece on time and determinism, however, Prior, while
still characterizing his view as Peircian, seems to maintain that future
contingent propositions are simply false. For when one asserts (23)
or (24), the "will" means "will definitely."[16] If the state of affairs
described by *p* is not settled yet, *Fnp* and *FnNp* are both false, that
is to say, it is equally false to assert either that "It will be the case that
*p*" or that "It will be the case that ~*p*." What is true is (24), namely,
"It is not the case that it will be the case that *p*."[17] This preserves,
says Prior, the Law of Excluded Middle and the metalogical Law of
Bivalence. Presumably this is because "It will be the case that *p*" $\equiv$
□ *p* and "It is not the case that it will be the case that *p*" $\equiv$ ~ □ *p*,

and even in Lukasiewicz's three-valued system modal functions never take the third value. When $p = 1$ or $\frac{1}{2}$, $\diamond\, p = 1$; under both these conditions, $\sim\!\diamond\, p = 0$. So although $p \vee \sim p$ fails for this system, $\diamond\, p \vee \sim \diamond\, p$ holds, as does $\square\, p \vee \sim \square\, p$. Therefore, it is true that "Either it will be the case that $p$ or it is not the case that it will be the case that $p$." "It is the case that $\sim p$" $\equiv \square \sim p$, and $\square\, p \vee \square \sim p$ does not hold because it is possible that neither $p$ nor its negation be determined by the present state of affairs. Thus, Excluded Middle is retained. Moreover, Bivalence is preserved because no appeal need be made to a third truth value; future contingent propositions are always false. However, the peculiar feature of the Peircian system, Prior observes, is that contingently true predictions are, perversely, inexpressible. The Peircian can say, "It will be the case that $p$" only when $p$'s "futurition" is necessary. When it is not necessary, but will occur all the same, he must say that "It will be the case that $p$" is *false*. For such a statement is true only when it is necessary that $p$'s corresponding state of affairs be actualized. For any contingent proposition $p$, "It will be the case that $p$" must be false, and yet tomorrow $p$ may be true. Thus, the sense in which "It will be the case that $p$" is true when the relevant state of affairs is actualized contingently must elude the Peircian. Nonetheless, Prior still finds this system preferable to the Ockhamist view that future contingent propositions may be *true*, which Prior apparently holds to be fatalistic.

### Nelson Pike

Much less sophisticated, but far more influential has been Nelson Pike's case for theological fatalism, as presented in his "Divine Omniscience and Voluntary Action" (1965) and again in *God and Timelessness* (1970). Although Pike at first confessed that his argument had a "sharp, counterintuitive ring,"[18] over the years he has apparently become more entrenched in his position, despite the attacks of many critics. His point of departure is several assumptions which he ascribes to Boethius:

25. "God is omniscient" is necessary.

26. If an individual is omniscient, that individual believes all true propositions.

27. If an individual is omniscient, that individual believes nothing false.

28. Omniscience is an essential property.

29. If an individual is God, he has and will always exist.

30. If an individual exists at a moment in time, he must hold any belief he holds at that time.

Pike will not consider whether these assumptions are correct, but he will argue that given these assumptions, if God exists, then no human action is voluntary. Unfortunately Pike seems somewhat confused as to what it means for an action to be voluntary. He later remarks that if a person did not have the "*ability* or *power* to do other than he did," then it is wrong to say the action he performed was voluntary.[19] Pike takes cognizance of a situation mentioned by Locke in which a person may perform an action voluntarily, unaware that he is not free to do otherwise.[20] If Locke is right, Pike now states, then "voluntary" should be replaced with "free" in Pike's argument. But in a later piece, Pike states that if my performing some action was the result of certain causal determinants, then we cannot describe my performance of that action as a "carrying out of my own decision" and therefore the action "was not free."[21] Pike never satisfactorily differentiates these two notions. Nor does he explain what he means by "ability" or "power." He merely states that the notion of being able to do something and having it within one's power are essentially the same.[22] In a later article, however, he specifies that "within one's power" cannot be equated with the logical possibility of an action. Rather to say some action is not in one's power means that given certain physical conditions, that action is not possible for him. By "physical conditions," however, Pike means not causal conditions, but rather the whole actual past history prior to one's act: "When assessing what is within my power at a given moment, I must take into account the way things are and the way things have been in the past."[23] If, given the actual context in which an act is performed, one can do the opposite, then it is within one's power to refrain from that act.

Now Pike will argue that if God knew 80 years in advance that Jones would mow his lawn Saturday afternoon, then at that time Jones was not able, that is to say, it was not within Jones' power, to refrain from mowing his lawn. Pike admits that had Jones refrained, then God (or Yahweh, as Pike calls Him in his revised article) would have believed differently. But "By the time Saturday got here, Yahweh's belief was tucked away eighty years in the past. Nothing that Jones was able to do on Saturday could have had the slightest bear-

ing on whether Yahweh held a certain belief eighty years earlier."[24]
Hence, Jones did not have the power to refrain, and his action cannot
be counted as voluntary. This argument may be formulated:

31. "Yahweh is omniscient and Yahweh exists at $t_1$" entails "If
Jones does A at $t_2$, then Yahweh believes at $t_1$ that Jones does
A at $t_2$." (Assump. 26, 30)

32. If Yahweh is essentially omniscient, then "Yahweh believes
$p$" entails "$p$". (Assump. 27, 28; doctrine of infallibility)

33. It is not within one's power at a given time so to act that
both "$p$" and "not-$p$" are true.

34. It is not within one's power at a given time so to act that
something believed by an individual at a time prior to the given
time was not believed by that individual at the prior time.

35. It is not within one's power at a given time so to act that
an individual existing at a time prior to the given time did not
exist at the prior time.

36. If Yahweh believes at $t_1$ that Jones does A at $t_2$, then if it is
within Jones' power at $t_2$ to refrain from doing A, then either:

(i) It was within Jones' power at $t_2$ so to act that Yahweh believed
$p$ at $t_1$, and "$p$" is false; or

(ii) It was within Jones' power at $t_2$ so to act that Yahweh did
not believe as He did at $t_1$; or

(iii) It was within Jones' power at $t_2$ so to act that Yahweh did
not exist at $t_1$.

37. If Yahweh is essentially omniscient, then (i) is false. (32, 33)

38. If Yahweh is essentially omniscient, then (ii) is false. (34)

39. If Yahweh is essentially omniscient, then (iii) is false. (35)

40. Therefore: If Yahweh is essentially omniscient, and be-
lieves at $t_1$ that Jones does A at $t_1$ [sic], then it was not within
Jones' power at $t_2$ to refrain from doing $a$. (36-39)

41. Therefore: If Yahweh is essentially omniscient, and exists at
$t_1$, then if Jones does A at $t_2$, it was not within Jones' power at
$t_2$ to refrain from doing A. (40, 31)[25]

Pike then considers several attempts that might be made to refute
this reasoning. First, he takes up the distinction between *necessitas
consequentiae* and *necessitas consequentis*, which Pike understands to
be the claim that the argument may be framed in terms of contingent
truths. Noting Leibniz's assertion that foreknowledge involves only
hypothetical necessity,[26] not absolute necessity, Pike agrees that the
proposition:

42. God believed at $t_1$ that Jones would do A at $t_2$

does not entail

43. "Jones did [sic] A at $t_2$" is necessary.

But while the necessity of "Jones did A at $t_2$" is not entailed by the former proposition, its truth is. This is sufficient for the success of the argument. It is contingently true that God believes that Jones will do A; it is contingently true that Jones does A; and it is contingently true that at $t_2$ Jones is not able to refrain from A.

Second, Pike disputes the Ciceronian argument recorded by Augustine that foreknowledge is causally related to the thing foreknown. The argument for theological fatalism presupposes no such causal connection; even if Jones' action had no cause at all, the argument remains unaffected. Pike elsewhere asks us to suppose that there were causal laws such that if God believed at $t_1$ that Jones would do A at $t_2$, then he would do A at $t_2$. Clearly it would be impossible for Jones to do anything else but A. Now delete the mention of causal laws. Let God's belief at $t_1$ be logically, rather than causally, sufficient for Jones' doing A. It would be logically impossible for Jones to refrain from A at $t_2$ and God to have believed at $t_1$ that Jones would do A. Hence, Jones is not free to refrain.[27]

Third, Pike denies that his argument can be simply reduced to the argument for logical fatalism. In his first piece, Pike appears to call into question the intelligibility of

44. It was true at $t_1$ that $E$ would occur at $t_2$.

It makes sense, he opines, to suppose that God held a true belief prior to Saturday. "But this is not to suppose that *what* God believed *was true 80 years prior to Saturday.*"[28] Pike declines to discuss whether what God believed was true 80 years prior to Saturday on the grounds that a decision on this issue is irrelevant to the cogency of his argument. In his second piece, Pike disputes Prior's comment that while it is intelligible to maintain that a future contingent proposition was *true* yesterday, it is not intelligible to hold that it was *known* yesterday because there was at that time no ground for knowledge. Prior incorrectly assumes that foreknowledge is like a prediction based on evidence, when it is in fact a "noninferential, visionary knowledge."[29] So understood, foreknowledge does not imply that "Jones does A at $t_2$" is true at $t_1$. According to Pike, it is "obscuristic [sic] and strange" to date the truth value of a proposition in which the date is assigned to the event.[30] "Jones does A at $t_2$" is simply true, and one need not add "at $t_2$." "Of course, if 'Jones does A at $T_2$' is true, then it must be known (infallibly believed) at $T_1$ by an omniscient

being. This is not to say that it is *true at $T_1$*—it means only that it is *believed* (or known) *at $T_1$*."[31] I think we may take Pike's position to be that tenseless propositions with definite temporal indexicals are timelessly true and that therefore it is incorrect to say that such a proposition $p$ is true at $t_n$; but it is the case that God at $t_n$ believes $p$, and this infallible belief is all that the argument for theological fatalism presupposes.[32] Hence, Pike claims that his argument may not be reduced to the argument for fatalism based on antecedent truth.

Pike believes that theological fatalism may be avoided by maintaining that God is timeless. He points out that Jones has the power to act at $t_2$ such that God would not believe as He will in fact believe at $t_3$. In such a case Jones could act otherwise, but he simply will not. By contrast, when God's belief is in the past Jones does not have the power to act such that God would not have believed as He did in fact believe. Pike therefore agrees with Boethius that if God is timeless, then He simply "sees" and believes whatever Jones is doing, and Jones has the power to perform an action other than that which he is performing so that God's belief would be other than what it in fact is.

By contrast, Prior's position (that foreknowledge does not exist and that God is temporal) reduces to absurdity because human agents often have foreknowledge, which Prior's position would preclude. Pike argues that human foreknowledge does not entail fatalism as does divine foreknowledge. His point of departure is Augustine's contention that foreknowledge does not entail fatalism because an intimate friend may have foreknowledge of one's voluntary actions without thereby removing one's freedom. It is Pike's contention that the case of the intimate friend differs essentially from the case of God's foreknowledge. He asks us to imagine that Smith knew at $t_1$ that Jones would do A at $t_2$. It follows from this that Jones did in fact do A at $t_2$. Nevertheless, it was still in Jones' power to refrain from A at $t_2$. For although Smith's belief at $t_1$ was in fact true, it might have turned out to be false. This is because Jones in fact did A, but he might not have. He had the power at $t_2$ to refrain; he simply did not exercise it. But the same cannot be said with regard to God's belief, since we cannot say that God's belief was in fact true but might have been false. In God's case alone is truth analytically connected with belief:

> We get to the difference which makes the difference when, after analyzing the notion of knowledge as true belief (supported by evidence) we discover the radically dissimilar relations between truth and belief in the two cases. When truth is only factually connected with belief (as in Smith's knowledge) one can have the power (though, by hypothesis, one will not exercise it) to do something that would make the belief false. But when

truth is analytically connected with belief (as in God's belief) no one can have the power to do something which would render the belief false.[33]

Thus, in Smith's case there are really two contingencies: that Smith held a certain belief and that that belief was true. Jones can act to falsify the second contingency, not the first. Since in God's case the second contingency does not exist, Jones cannot falsify God's belief and is therefore not free to do otherwise than as God believed. By contrast, in Smith's case,

> Paradoxical though it may seem (and it seems paradoxical only for a moment) Jones can be assigned the power at $T_1$ so to act that what was in fact knowledge at $T_1$ was not knowledge but false belief. This is simply to say that Jones can be assigned the power at $T_2$ so to act that the belief held by Smith at $T_1$ (which was in fact true) was (instead false). We are required only to add that since Smith's belief was *in fact*, true (i.e., was *in fact*, knowledge) Jones did not, in fact, exercise the power.[34]

Pike thinks that the crucial factor in the difference between Smith and God is that God is not merely in fact omniscient, but essentially omniscient. In Pike's opinion, if we were to hold that God is merely in fact omniscient, but not essentially omniscient, then His knowledge would not differ from Smith's and fatalism would be escaped. If an individual is God, states Pike, it is necessary that he be omniscient; but he need not be necessarily omniscient in the sense of essentially omniscient.

Pike's conclusion would thus appear to be that fatalism is entailed by the foreknowledge of a temporal, essentially omniscient God and that the best escape from this is not to be found in denying the truth value of future contingent propositions, but in either ascribing timelessness to God or in denying His essential, as opposed to actual, omniscience. Since Pike objects to divine timelessness on other grounds, we may presume that he prefers the second option.

Although Prior and Pike are the most prominent exponents of the fatalistic argument based on divine foreknowledge, others might be mentioned as well; for example, Paul Helm, who unlike Prior and Pike, apparently actually believes theological fatalism, rejecting all escape routes, including the denial of bivalence for future contingent propositions or the timelessness of God's knowledge.[35] One might also mention Gary Iseminger;[36] and Stephen Boothe, a doctoral student of Pike, who lays particular emphasis on the temporal necessity of God's past beliefs.[37] More recently William Hasker has emerged as a stubborn opponent of divine foreknowledge due to its alleged fatalistic consequences.[38] A great many other thinkers have defended implicitly fatalistic positions on analogous issues, as we shall see. For now, however, these two writers may serve well as representative samples of the theological argument for fatalism.

# REDUCTION OF THEOLOGICAL TO LOGICAL FATALISM

It seems clear from the foregoing exposition of the arguments of two prominent theological fatalists that they have fastened upon the medieval argument for fatalism based on the necessity of the past, which derives its inspiration from Aristotle's second formulation of the fatalistic reasoning.[1] Most modern protagonists of theological fatalism would in the end probably agree, however begrudgingly, with D. C. Williams's judgement that Aristotle's argument is "so swaggeringly invalid that the student can hardly believe he meant it."[2] When Aristotle infers from

> 1. If every affirmation (or negation) is true or false, it is necessary for everything either to be the case or not to be the case

that

> 2. Everything will or will not be of necessity and not as chance has it,

he moves fallaciously from $\Box\,(p \supset q)$ and $p$ to $\Box\,q$. The insight already discerned by Boethius, that the consequent may follow necessarily from the antecedent without being itself necessary was expressed in the medieval distinction between *necessitas consequentiae* and *necessitas consequentis*. Hence, modern theological fatalists are quick to insist that their formulation of the problem does not blur this distinction. For if it can be shown that it is not merely true that $p$, but necessarily true that $p$, then Aristotle's argument is valid. Accordingly, modern defenders of fatalistic reasoning nearly always appeal to the Aristotelian notion of temporal necessity in order to secure $\Box\,p$. In this case $p$ is a proposition expressing some fact about a past event or state of affairs such as "God knew that $q$" or "God believed that $q$." Since, furthermore, "If God knew that $q$, then $q$" is a necessary truth, it follows that $q$ is necessary. Hence, the argument, in avoiding Aristotle's modal fallacy, cannot, it is claimed, be reduced to the purely logical argument for fatalism.

The situation is not, however, so simple. It seems clear that the argument for theological fatalism is not simply the old Aristotelian argument dressed up in theological guise, for the two have a different logical form. Aristotle, as I read him, never appeals to the necessity of the past in order to justify $\Box\,p$, but reasons $p$; $\Box\,(p \supset q)$; $\vdash \Box\,q$. To that extent their arguments are distinct. On the other hand, it is not so

clear that the role of God and divine foreknowledge, or indeed of any knowing subject, is not merely an unessential heuristic or illustrative device, so that the argument is reducible, if not to Aristotle's version, at least to some version of a purely logical argument for fatalism. This question is significant because should it prove to be the case that the argument is so reducible, then the problem is not unique to philosophy of religion but must concern any philosopher who believes that there are contingent propositions.

Susan Haack has contended that the argument for theological fatalism is no more than "a needlessly (and confusingly) elaborated version" of Aristotle's argument in *De interpretione* 9; the addition of an omniscient God to the argument constitutes a "gratuitous detour" around the real issue, which is the truth or falsify of future contingent propositions.[3] The question raised by Haack is whether the temporal necessity ascribed to God's past belief might not be more simply ascribed to some past state of affairs constituted by a future-tense proposition's being true. Although a number of recent writers have disputed this reduction, their protestations seem to have little foundation. Calling logical fatalism a "pseudo-problem," Zagzebski, for example, asserts that the truth or falsity of a proposition is not an event or state of affairs and has no causal effect on the world so as to prevent the causal contingency of events.[4] But neither does divine foreknowledge causally constrain events (which fact only highlights the absurdity of fatalism); more importantly, a future contingent proposition's being true (or false) most certainly is a state of affairs, and Zagzebski admits as much in her refutation of Aquinas's timelessness solution to theological fatalism.

An examination of the typical arguments for theological fatalism bears out the validity of this reduction. Prior's own formulation of the argument omits all reference to God, depending merely on his (6), that if it was the case $n$ time units ago that $p$, then necessarily it was the case $n$ time units ago that $p$. And despite his protestations, it seems to me that Pike's version is also so reducible.[5] For one could replace his (31) with

> 31*. If Jones does A at $t_2$, then it was true at $t_1$ that "Jones does A at $t_2$"

or with

> 31**. If Jones does A at $t_2$, then it was true at $t_1$ that "Jones will do A at $t_2$"

or with

> 31***. If Jones does A at $t_2$, then it could have been truly asserted at $t_1$ that "Jones does A at $t_2$"

or with

> 31****. If Jones does A at $t_2$, then it could have been truly asserted at $t_1$ that "Jones will do A at $t_2$."

Pike apparently holds to the timeless truth of propositions outfitted with definite temporal indexicals and so would reject the reduction to (31*); but nothing in his analysis precludes reduction to (31**)-(31****). The temporal necessity of these past states of affairs would serve as effectively as God's past belief in securing fatalism.[6]

Although Boothe disagrees with this reduction of his mentor's argument, it is not clear to me that his own assumption

> 3. $(x)$ (If $x$ is God, then if it was the case that $p$, it is temporally necessary that it was the case that $x$ believes that $p$)

is not replaceable by

> 3*. If it was the case that $p$, it is temporally necessary that it was the case that $p$.

Boothe disputes the reduction of the foreknowledge argument to what he calls the foretruth argument because the latter presupposes the Principle of Bivalence whereas the former does not.[7] The foreknowledge argument proceeds from the necessity of "God believed that $p$" to the necessity of $p$ without any assumption that $p$ is true or false. In effect, Boothe is claiming that the state of affairs of God's believing $p$ may be temporally necessary while the state of affairs of $p$'s being true either is not temporally necessary or does not obtain. Unfortunately, Boothe's own argument assumes that necessarily, if God believes that $p$, then it is true that $p$, so that God's believing $p$ entails that the state of affairs of $p$'s being true obtains; nor is it easy to see how the foreknowledge argument could get along without this assumption. Therefore, if Boothe is to resist the replacement of (3) by (3*), he must show why the state of affairs of $p$'s being true, though obtaining, is not, like the state of affairs of God's believing $p$, temporally necessary. Unfortunately, Boothe does not elucidate any conception of temporal necessity which would sanction such a differentiation. Unless such a conception can be elucidated, the foreknowledge argument adds essentially nothing to the foretruth argument.

Boothe might appear able to draw comfort from the recent work of Freddoso, himself not a fatalist, but one who believes that ". . . the

argument for determinism from divine foreknowledge is, contrary to what some have claimed, more difficult to contend with than is the argument for logical determinism."[8] Freddoso champions an Ockhamist solution to the problem of logical fatalism whereby propositions which depend for their truth conditions on times other than the immediate present cannot be temporally necessary. Freddoso's analysis of temporal necessity is not dissimilar to Boothe's, except for the crucial difference that Freddoso emphasizes what he calls the metaphysical primacy of the pure present. This he takes to mean that for any time $t$ and any logically possible world $W$, there is a set $k$ of purely present-tense propositions such that ($i$) each member of $k$ is true at $t$ in $W$ and ($ii$) $k$ determines what is true at $t$ in $W$ in a way which does not temporally depend on what has been or will be true in $W$ at times other than $t$. This set of propositions he calls a submoment of $W$. Two worlds share the same history at $t$ if they share exactly the same series of submoments prior to $t$. A proposition is temporally necessary (or as Freddoso prefers, necessary *per accidens*) if in every possible world having the same history as the actual world prior to $t$ that proposition is true at $t$ and at every time thereafter. Freddoso argues that a proposition like

4. It was the case that $p$ will be true,

where $p$ is in the present-tense, is not true in every world sharing the same history as the actual world. This is because a world's history is comprised of submoments constituted only by purely present, or immediate, propositions, and a proposition like "$p$ will be true" is not immediate, since it depends for its truth on moments other than the pure present. Hence, in some worlds sharing the same history (4) is false at $t$. Now the relevance of this analysis to theological fatalism becomes evident when we consider Freddoso's examples of propositions that are immediate:

5. David is sitting.

6. David is standing and it will never be the case that David has never stood.

7. David believes that Katie will travel to Rome next week.

Propositions like (7) which involve present-tense propositional attitudes without qualification are, states Freddoso, clearly immediate because the truth conditions involve no reference to a time other than the present. Thus, ". . . the past hopes, fears, beliefs, desires, predictions, etc., of historical agents are clearly unalterable elements of our past and must be counted as part of our history by any ex-

plication of what it is for two worlds to share the same history at a given time."[9] Accordingly, this suggests that the proposition

8. God believes $p$,

where $p$ is a future-tense proposition, is an immediate proposition and therefore a member of the set of propositions constituting a submoment in W. In short, (8) unlike (4) expresses a fact in the history of a world such that two worlds cannot share identical histories unless (8) is true in each world. This means that (8) when in the past-tense is temporally necessary, and therefore $p$, when stated tenselessly with definite temporal indexicals, is temporally necessary, since necessarily (8) implies $p$.

But is (8) really an immediate proposition? Freddoso's own analysis furnishes the insight which suggests that it is not. For, he observes, propositions expressing propositional attitudes which are alethically qualified seem to constitute exceptions to the general rule concerning the immediacy of propositions involving present-tense propositional attitudes. For propositions like

9. David correctly believes that Katie will go to Rome

and

10. David mistakenly fears that Katie has gone to Rome

depend in part for their present truth value on whether the immediate proposition "Katie is in Rome" has been or will be true. From this Freddoso draws the conclusion that "As a general rule, a proposition involving a present-tense propositional attitude directed at a past- or future-tense proposition $p$ is immediate unless it entails $p$ or the negation of $p$."[10] But of course, in God's case His belief of $p$ does entail that $p$; indeed, this is the second crucial premiss in the fatalist's argument: $\Box\,(p \supset q)$. As Freddoso concedes, ". . . if God exists, he is essentially omniscient—so that necessarily God believes $p$ just in case God correctly believes $p$."[11] This being the case, (8) is equivalent to

11. God correctly believes $p$

and is no more immediate than (9). Moreover, whereas (9) can be analyzed as the conjunction of the two atomic propositions "David believes that Katie will go to Rome" and "Katie will go to Rome," the former being immediate and the latter non-immediate, no such analysis is possible for (11), since "God believes $p$" itself entails $p$, so that such an analysis spawns on infinite regress and never arrives at a non-immediate atomic constituent of (11). If one does allow (11) to be represented by the formula "$p$ and $Fq$," where $p$ represents (8),

then $p$ would fall into that class of formulas recognized by Freddoso to be atomic, but non-immediate. On Freddoso's own definition, (8) cannot be immediate or temporally indifferent because it is impossible for it to be true at $t$ if $t$ is the last moment of time.[12] It follows that propositions concerning God's propositional beliefs are therefore not immediate and therefore not, in the past tense, temporally necessary. Freddoso would, I am sure, agree with this,[13] and his call for a separate argument with regard to theological fatalism as opposed to logical fatalism concerns not the solution of the problem, but the position that propositions like (8) are not, despite appearances, immediate. In effect, therefore, all Freddoso is calling for is a separate argument for the reduction of theological to logical fatalism, which are then both resolved by a common solution.

Therefore, it seems to me that the problem of theological fatalism is reducible to a statement of purely logical fatalism involving no reference to God or to any knower. Such an argument would be based on the temporal necessity of some proposition like "It was the case that $p$," where $p$ is a future-tense proposition. Since the past is unalterable, no one has it within his power to make it such that it was not the case that $p$. Since "It was the case that $p$" entails "$p$", it follows that "$p$" is necessarily true. If the argument for theological fatalism is cogent, then so is this argument; and if this argument can be shown to be defective, then the proof of theological fatalism must also be unsound.

# LOGICAL FATALISM

What has already been said is enough to remove the onus of theological fatalism from the shoulders of the Christian theist, but it still remains to assess the argument for fatalism itself. Perhaps the most intellectually rewarding path toward a solution of that problem is to leave aside for a moment the theological version of the problem and to return to it only after we have profited from an analysis of the purely logical form of the argument.

## *Richard Taylor*

Undoubtedly the name most associated with the modern defense of fatalism is that of Richard Taylor. Beginning in the late fifties and then throughout the sixties, Taylor published a series of articles in which he repeatedly reaffirmed from various philosophical vantage points fatalistic conclusions.[1] Although one is apt to interpret him as a devil's advocate of fatalism, Taylor in the end cast himself as one who sincerely believed in the fatalistic conclusions he drew. In his *Metaphysics*, for example, he speaks warmly of fatalism as enhancing the feelings, opening the heart, and enormously broadening one's understanding.[2]

According to Taylor, fatalism may be demonstrated on the basis of six presuppositions:

1. Any proposition is either true, or if not true, false. (Law of Excluded Middle)

2. If a state of affairs is sufficient for another state, the former cannot occur without the latter occurring also.

3. If a condition is necessary for another, the latter cannot occur without the former.

4. If one set of conditions is sufficient for another, the other is necessary for it, and conversely.

5. No agent can perform an act if a necessary condition for the performance of that act is lacking.

6. The mere passage of time does not enhance or decrease an agent's powers or abilities.

A word of explanation should be said concerning each of these pre-suppositions. With regard to (1), Taylor takes this to be a statement of Excluded Middle and in an earlier piece on future contingents had denied its validity for future contingent propositions, affirming what he called "the doctrine of real contingencies."[3] He argued that Aristotle was justified in believing some propositions to be neither true nor false, and he saw future contingents as an area of applicability for three-valued logic. These remarks, as well as (1) itself, make it evident that what Taylor calls the Law of Excluded Middle is in fact the Principle of Bivalence.

Presuppositions (2)-(4) are explained in Taylor's earlier article on backward causation. There he noted that "A is sufficient for B" means "$(A \cdot \sim B)$ is impossible," and "A is necessary for B" means "$(\sim A \cdot B)$ is impossible". Therefore, if A is sufficient for B, then B is necessary for A and vice versa. Moreover, "A causes B" means "A is sufficient for B," where A, B are actual conditions at some time. Taylor held that there is "surely . . . nothing in the causal relation other than this relation of sufficiency."[4] The effect is guaranteed by the occurrence of such conditions as are sufficient for it. On this basis he defended the notion of backward causation, since a future event may be every bit as much the sufficient condition for a present event as is a past event. Although he later came to reject retrocausation as "plainly absurd," contending that the analysis of cause and effect in terms of mere necessary and sufficient conditions was "the profoundest error in modern philosophy" and "the source of more misconceptions than any other,"[5] still he insisted that the impossibility of backward causation did not affect the argument for fatalism because even if causes operate only in a forwards direction, necessary and sufficient conditions do not.[6]

Presupposition (5) reflects Taylor's earlier analysis of "I can." There he makes it clear that he is not concerned with ability in terms of training, strength, or opportunity.[7] But he does discuss—and reject—four possible analyses of "can" in the statement "I can move my finger" in terms of logical, causal, epistemic, and hypothetical possibility. Taylor approaches fatalism when he asks us to suppose that I resolve irrevocably to move or not to move my finger depending on whether a causally indeterminate roulette wheel comes up odd or even. In this case it is not true that I can move my finger nor that I can not move my finger until the wheel stops. This illustration shows that what is meant by "can" in "I can move my finger" is that it is causally contingent and that it is "up to me" or "within my power." This latter phrase is, muses Taylor, "a philosophically baffling expres-

sion which I feel no one can ever analyze"—yet it is well understood.[8] In the case of the roulette wheel, it is not "up to me" to move my finger, but up to something else, even though the action is causally contingent. Interestingly, in his earlier piece on backward causation, Taylor admitted that it is "up to me" whether things happen in the future in a way in which things in the past are not "up to me."[9] He was puzzled because that meant that this expression contains some idea that cannot be analyzed in terms of necessary and sufficient conditions, but that it is difficult to see what this idea might be. By the time he wrote "Fatalism", Taylor had apparently become convinced that there was no such idea and that future sufficient conditions bind my power to the same degree as past sufficient conditions. Rather than finding some additional idea in "within my power" than freedom from sufficient conditions, he instead found some additional idea (namely productive power) in causation beyond necessary and sufficient conditions. Hence, he could argue for fatalism without invoking backward causation.

In his earlier article, "Future Contingencies," Taylor sought to escape fatalism by in effect denying presupposition (6). According to the fatalist, if "$e$ has happened" is true, then $e$ is unalterable; by parity of reasoning, if "$e$ will happen" is true, then $e$ is unpreventable. Taylor's solution was to deny that "$e$ will happen" is true; for the future, unlike the past, is open to opposites:

> The past consists of everything that has happened, and . . . the fact that they have happened renders impossible forever after the occurrence of anything else in their place. The future, too, consists of everything that will happen; but here nothing has happened to preclude the occurrence of either of two . . . incompatible events.[10]

The passage of time thus affects one's power to alter the course of events. In his article on backward causation, however, Taylor refutes the objection that present actions can influence future actions but cannot influence past actions.[11] "Influence" means "be sufficient," and present actions may influence the past in the same sense that they influence the future. Where our past actions are necessary conditions for our present actions, our present actions are sufficient conditions for our past actions. Taylor furnishes the following diagram:

$$C_1 \longrightarrow E \longleftarrow C_2$$
$$T_1 \qquad T_2 \qquad T_3 \qquad T_4 \qquad T_5$$

Assume that $C_1$ and $C_2$ are alike sufficient for E, though neither is necessary; E is necessary but not sufficient for $C_2$. Let $C_1$ be Smith's

drinking poison; E be his dying; and $C_2$ be his opponent Jones' being elected to political office. Taylor contends there are no grounds for regarding $C_1$ rather than $C_2$ as responsible for E. Whether E happens depends equally on whether $C_2$ occurs as on whether $C_1$ occurs. As for the thought that by $T_5$, $T_3$ will already be past and E have occurred or not, we can equally say that at $T_1$, $T_3$ will be as yet future and E will or will not occur. It might be protested that at $T_4$ we can do $x$, which is sufficient to prevent $C_2$. Taylor replies that either $C_2$ will occur at $T_5$ or not. If it will, then it is false that we can do $x$ at $T_4$—because the non-occurrence of $C_2$ is a necessary condition for the occurrence of $x$. Only if $C_2$ is not going to occur at $T_5$ can we do $x$ at $T_4$. In any sense in which we can do $x$ at $T_4$ we can do $y$ at $T_2$ so as to prevent $C_1$ (for example, find Smith healthy and free from poison). For either $C_1$ occurred at $T_1$ or not. If it did, it is false that we can do $y$ at $T_2$; if it did not, we can do $y$ at $T_2$. Any sense in which we cannot do $y$, concludes Taylor, we cannot do $x$. Later, as I mentioned, Taylor revised his understanding of causality such that the relation of sufficiency here described did not serve to exhaust the meaning of the causal relation. But Taylor retained the view that insofar as actions' lying within my power is concerned, the issue of temporal priority does not arise; the past and the future are on a par.

Having laid out his six presuppositions, Taylor then invites us to consider the following situation: let $P$ = "A naval battle occurred yesterday;" $P'$ = "No naval battle occurred yesterday;" $S$ = "I read in the newspaper there was a battle;" and $S'$ = "I read in the newspaper there was not a battle." He then argues:

7. If $P$ is true, it is not within my power to do $S'$.

8. If $P'$ is true, it is not within my power to do $S$.

9. Either $P$ is true or $P'$ is true.

10. Therefore, either it is not within my power to do $S$ or it is not within my power to do $S'$.

The key to the reasoning is that if $P$ is true, there is lacking a condition essential for my doing $S'$, namely, there being no battle yesterday; similarly for $P'$ and $S$. In a hypothetical sense, admits Taylor, I do have power over the past. If I do $S$, it will ensure that $P$. If I do $S'$, it will ensure that $P'$. For these acts are sufficient for the occurrence of the reported events (assuming for the sake of argument that the newspaper must be accurate). But the problem is that I cannot do $S'$ unless $P'$ is true.

Taylor now invites us to consider a second situation. Let $O$ = "I order a naval battle;" $O'$ = "I do not order a naval battle;" $Q$ = "A

naval battle will occur tomorrow;" and $Q' =$ "No naval battle will occur tomorrow." By parity of reasoning, one may argue:

11. If $Q$ is true, it is not within my power to do $O'$.

12. If $Q'$ is true, it is not within my power to do $O$.

13. Either $Q$ or $Q'$ is true.

14. Therefore, either it is not within my power to do $O$ or it is not within my power to do $O'$.

In this case, if $Q$ is true then there is lacking a condition essential for my doing $O'$, namely, the condition of there being no naval battle tomorrow. What sort of order I issue depends on whether a naval battle occurs tomorrow or not, for by (4) the battle is a necessary condition of my doing $O$.

Taylor's thinking may be illustrated by means of his above retro-causal diagram. If we let E = the occurrence of a naval battle, $C_1$ = the command to engage in the battle, and $C_2$ = one's reading about the battle in an accurate newspaper, then under the assumed conditions, $C_1$ and $C_2$ are both sufficient for E's occurrence, while E is a necessary condition of both $C_1$ and $C_2$. Taylor's strategy in "Fatalism" is much the same as in his piece on backward causation: he repeatedly underscores the point that if it is in our power to do something such that the future would be other than it will be, then by parity of reasoning we must say that it is within our power to do something such that the past would be other than it is. And this Taylor takes to be absurd: we are all fatalists about the past, he says. Thus, he writes that it is not within my power to read a headline that the battle occurred yesterday if it did not. If this were in my power, then I could make a battle occur yesterday which did not in fact occur. But "No one doubts that fatalism with respect to the past is true; i.e., that we have no power to make happen what did not in fact happen."[12]

Thus, Taylor's argument is closely related to the argument for theological fatalism based on temporal necessity. His support for (11) and (12) consists not simply in (5), but hinges on the similarity of these propositions to (7) and (8), which express the notion of temporal necessity. If it is not within my power to perform an action of which a past necessary condition is lacking, why should it then be thought that it lies within my power to perform an action of which a future necessary condition is lacking? Taylor concedes that it is tempting to think that no condition can be necessary for another before the condition exists. But this would contradict (5) and (6), which Taylor takes to be obvious truths. If what does not yet exist

cannot be a necessary condition of what exists prior to it, then what no longer exists cannot be a necessary condition of anything existing subsequently. "The fact that there is *going* to be a naval battle to-morrow is quite sufficient to render me unable to do O´, just as the fact that there *has been* a naval battle yesterday renders me unable to do S´. . ."[13] If it be admitted that a future condition may indeed be a necessary condition for the performance of some action but be denied that it is a necessary condition for the *ability* to perform that action, then Taylor will respond that this is true only in the ordinary sense of ability as know-how, strength, skill, and so forth, but not in the special sense of ability employed in the fatalistic argument.[14] If we say that we have the ability in this sense to perform an act of which a necessary condition is lacking, then we should have the ability to do things sufficient for past events which did not occur — which is absurd. Taylor's argument, therefore, in its unfolding of this peculiar notion of ability relies heavily upon intuitions concerning temporal necessity.

Now in his "Fatalism," as in his earlier "Future Contingencies," Taylor sought to evade fatalism by denying the Law of Excluded Middle for future contingent propositions.[15] Subsequently, however, Taylor became convinced on the basis of an argument formulated by Steven Cahn that the denial of Excluded Middle would not suffice to evade fatalism without absurdity. According to Cahn, even if we grant that Excluded Middle does not hold for future contingent propositions, it is still the case that

> 19. In order to issue order O at $T_1$ all conditions necessary for the issuance of that order must then be satisfied, and one of those conditions is that a naval battle occurs at $T_2$. But this condition is not satisfied at $T_1$. Therefore order O cannot be issued at $T_1$.

> 20. In order to issue order O´ at $T_1$, all conditions necessary for the issuance of that order must then be satisfied, and one of those conditions is that no naval battle occurs at $T_2$. But this condition is not satisfied at $T_1$. Therefore order O´ cannot be issued at $T_1$.

> 21. Thus, neither order O nor order O´ can be issued at $T_1$.

Cahn concludes that if one tries to avoid the conclusion of Taylor's argument by denying the Law of Excluded Middle with regard to future contingent propositions, ". . . then one is led to deny that any action whatever can occur, a conclusion even stranger than that which Taylor's argument purported to prove."[16] In a comment on Cahn's article, Taylor praises Cahn's acumen as "thoroughly stunning" and concedes

that his argument is unanswerable.[17] He therefore feels constrained to abandon the escape route from fatalism of denying Excluded Middle and to admit that he sees no way out.

Interestingly, Taylor was not all dull to the implications of his fatalism for the doctrine of divine foreknowledge. He remarks that if it be assumed that there is an omniscient God, then that assumption can be incorporated into his argument so as to convey the reasoning more easily to the unphilosophical imagination; but he insists that this assumption contributes nothing to the cogency of the argument.[18] Omniscience was once conceived to be the source of the problem, but now it is seen to be the truth of future contingent propositions.[19] His earlier denial of the truth or falsity of such propositions precluded God's knowledge of them: God knows all that is knowable, but such propositions, being neither true nor false, are not knowable.[20] Presumably with Taylor's later acknowledgment that this solution led to absurdity, he would agree that God does know future contingent propositions and that fatalism is true.

## Taylor's Response to his Critics

Taylor's various articles elicited responses by both defenders, principally Steven Cahn, and opponents, among whom perhaps John Turk Saunders stands as chief. A brief survey of Taylor's replies to his critics serves to bring into sharper relief several of the crucial issues raised by Taylor's argument.

Rogers Albritton and Saunders both criticized Taylor's defense of logical fatalism on the grounds of the timelessness of truth.[21] According to Albritton it is unintelligible to say a proposition is "now" or "not yet" true. Saunders maintains that because it is incorrect to hold that a future-tense sentence is true at a certain time prior to the event it predicts, Aristotelian fatalism is specious. If something is the case at a certain time, this entails the truth of any previous statement that the event will occur; but it does not entail the *previous truth* of any previous statement that the event will occur. Saunders believes that when we say someone spoke truly yesterday, we do not mean that what he said yesterday was true yesterday, but that he spoke yesterday and what he said is (tenselessly) true. The Law of Excluded Middle does not require future-tense sentences to be true prior to the events they predict. Hence, no problem of antecedent truth arises and no fatalistic consequences are entailed.

Taylor, on the other hand, had anticipated the objection based on the timelessness of truth and framed two replies to it: (i) it begs the

question to maintain that future contingent propositions can be cast
in a tenseless form, for this assumes that they are true or false; and
(ii) a timelessly true proposition cannot tell me whether the event de-
scribed has occurred or not, thereby failing to capture the full mean-
ing of the tensed proposition.[22]

Bruce Aune, Raziel Abelson, and Saunders all raised objections to
Taylor's understanding of "can" or "within one's power."[23] According
to Aune the "can" in presupposition (5) is the "can" of ability, but
Taylor's use of "can," "power," and "ability" elsewhere in the argu-
ment is extremely misleading—so much so that the argument becomes
trivially absurd. For consider some action A, a necessary condition of
which is some exertion. It follows from (5) that whenever a person is
not so exerting himself, it is not within his power to do A. But this is
absurd, as if to say that I cannot swim because I am not in the water.
In fact, since A is a necessary condition of itself, A is in my power iff
I am doing A. In this way, all modal distinctions collapse. Abelson
similarly charges that in presuppositions (2)-(5) Taylor equivocates
between logical and causal necessity. In (2) and (3) he seems to refer
to a causal modality, while (5) seems to refer to logical modalities.
Taylor's equivocal (2)-(5) allow him to shift from the innocuous log-
ical truth, "If $O$ implies $Q$, and $\sim Q$, then necessarily $\sim O$" to the
dubious premiss of his argument, "If $\sim Q$ occurs, then $O$ is impossi-
ble." Saunders also accuses Taylor of equivocation. Taylor correctly
sees that no agent can perform an act if a necessary condition for that
act is lacking; but all this means is that necessarily, if condition $x$ is
necessary for the occurrence of act $y$, and $x$ is lacking, then no agent
performs $y$. The "can" only serves to indicate that the consequent
follows logically from the antecedent. Taylor's equivocation occurs
in that he takes "can" to mean "has the power to." In this way he
became convinced that no one has the power to perform an act if a
necessary condition of that act is lacking.

We have seen that in "I Can" Taylor disclaimed any concern with
"can" in the sense of skill, training, and so forth. In his replies to
the above critics, he reiterates this, asserting that their common er-
ror is their treating "within my power," "possible," and "able" as
synonyms.[24] For it is possible that I should do something which is
not within my power to do, for example, inherit a fortune. And I
am often able to do something which it is not within my power to do
because a necessary condition is lacking, for example, play a piano
in a room where there is none. In this sense, I am able to issue an
order even when no battle occurs tomorrow; otherwise my mere abil-
ity would be sufficient for the battle's occurrence. But Taylor insists

that "ability" is not what "within my power" refers to, for then one could use the same argument to prove that we should not be fatalists about the past. I am indeed "able" to read a headline that no battle occurred yesterday, but surely it is not within my power to read such a headline if it does not exist. But similarly with regard to the future:

> Whatever may be my abilities, it is no more within my power to exercise those abilities in the absence of some past condition necessary for doing what they enable me to do, and thus to determine the past, than for the finest pianist to exercise his virtuosity in a room that contains no piano. And surely we have the same reason for saying that, whatever may be my abilities, it is certainly not within my power to exercise those abilities in the absence of some *future* condition necessary for doing what they enable me to do, and thus to determine the future.[25]

Richard Sharvy replied that Taylor's analysis only demonstrates an inability which is altogether trivial.[26] The conclusion "Either I do not have the power to perform $O$ or I do not have the power to perform $O'$" is equivalent to "I do not have both the power to perform $O$ and the power to perform $O'$." This appears fatalistic, but because of the fatalist's collapse of modal distinctions, it is trivial and not at all fatalistic. For in the fatalist's scheme, the distinction collapses between

22. I have both the power to do $x$ and the power to do $\sim x$

and

23. I have the power to do both $x$ and $\sim x$.

For (22) is equivalent to "I do $x$ and I do $\sim x$," and this means the same as "I do both $x$ and $\sim x$," which is the equivalent of (23). And it is no serious limitation on our freedom to say we lack the power to perform logically incompatible acts.

Taylor responded to Sharvey that he had never claimed the logical equivalence of "It is within my power to do $x$" and "I do $x$." His argument entails only that such statements have the same truth values. The actions one is able to perform are in fact identical with those he does perform. But "It is in my power to do $x$ and in my power not to do $x$" is not logically equivalent to "I do $x$ and I do not do $x$." For the former is simply false, but the latter is a contradiction. Therefore, the distinction between (22) and (23) remains.[27]

Although Taylor's critics continued to multiply, he issued no further rebuttals to their criticisms. Inasmuch as the debate became thus one-sided, we may reserve those critiques for our appraisal of the issues raised in the fatalistic dispute engendered by Taylor's work.

# SUGGESTED ESCAPES FROM FATALISM

The argument for fatalism, whether in its logical or theological version, is so counter-intuitive that few thinkers have been persuaded by it.[1] Rather the argument is regarded as an *aporia* akin to Zeno's paradoxes of motion, the aim being to uncover the flaw in an apparently plausible argument. But how do we know that fatalism is not in fact true? Since Aristotle, fatalism has been rejected as obviously false on the basis of our intuitively sensed freedom to do otherwise. But at the most this intuited freedom only suffices to disprove causal determinism, not fatalism. And fatalists insist as a man that they are not speaking of any sort of causal determinism: neither God's foreknowledge nor the antecedent truth of propositions is to be considered the cause of the fated event. But in this case, all the examples in the world of my intuited freedom say nothing against this abstract, non-causal fatalism. I am causally free to do otherwise and I sense this ability, but I am fated to choose as I do. We may not care for this conclusion, but it seems that my intuited sense of freedom is insufficient to prove it false.

Now it might be rejoined that fatalism is incoherent because actions which are causally contingent cannot be fated to occur; that is to say, apart from the influence of causes it is unintelligible to speak of an action's being constrained to occur one way.[2] This was, I think, Augustine's point when he declared it absurd that someone who is causally free might be necessitated to do something and why Pike originally regarded his own argument as so counter-intuitive.[3] If an action is causally contingent, then what is this mysterious "fate" which necessitates that this action be performed rather than its opposite? Augustine argued further that if I know that some action will be performed, that knowledge has absolutely no effect on the action's taking place, so that if I did not foreknow it nothing would occur differently. How then is it that my knowledge is said to have necessitated the action? Pike's rejoinder to Augustine that human foreknowledge does not necessitate the events foreknown as would divine foreknowledge raises what is, I think, a red herring. It is irrelevant whether Smith's beliefs are infallibly true or not; all that matters is that his belief about Jones's future action is in fact knowledge. If agent A foreknows that Jones will do $x$, then it necessarily follows that Jones

will do $x$. If Jones has the power so to act that, were he to act in that way, Smith's belief would have been false, then he has the power so to act that, were he to act in that way, God would have held a different belief. The "analytic connection" between God's belief and knowledge is therefore irrelevant; if the fatalistic reasoning is correct, human foreknowledge, like divine foreknowledge, would necessitate the events foreknown; but how this is possible in the absence of a causal connection is a mystery. Helm's denial that human foreknowledge exists cannot stave off this conclusion, for as he acknowledges, if it did exist, it would have fatalistic consequences.[4] But how foreknowledge could necessitate causally contingent actions or events remains problematic. Accordingly, it might be argued that fatalism is incoherent and that therefore the argument which led to this conclusion must be unsound.

It seems to me that such a rejoinder is in fact correct. The argument for fatalism must be fallacious, and we need only find the error. But this line of reasoning will have little appeal to those who argue that divine foreknowledge or the antecedent truth of future contingent propositions is incompatible with human freedom, for it suggests that there is no *intrinsic* incompatibility between foreknowledge or antecedent truth and freedom. An inconsistency arises only with the addition of further premises, which may be suspicious. In this chapter, however, we want to examine three attempts to escape fatalism which deny antecedent truth and foreknowledge and which are, I shall argue, ultimately unsuccessful.

### Denial of the Principle of Bivalence
### or the Law of the Excluded Middle

Status of the Principle of Bivalence

By far and away, the escape route most often proposed by would-be fatalists is that originally adopted by Taylor, namely, the denial of the validity of the Law of Excluded Middle for future contingent propositions. Considerable confusion concerning this Law and the related Principle of Bivalence is evident in the literature, however, and we have seen that Taylor's first presupposition was actually a statement of Bivalence, not Excluded Middle. The distinction between these two was underlined by the dean of Polish logic Jan Lukasiewicz in his "Philosophische Bemerkungen zu mehrwertigen Systemen des Aussagenkalküls" (1930).[5] It is a fascinating historical footnote that it was precisely the fear of fatalism that prompted Lukasiewicz to draft

his ground-breaking multivalent logic, thus parting company with the
Law of Bivalence, which he distinguishes from the Law of Excluded
Middle. According to the former, every proposition is either true or
false. According to the latter, two contradictory propositions can-
not be false simultaneously. (Lukasiewicz could have included in this
latter formulation that a proposition and its contradictory cannot be
true simultaneously, as well as false simultaneously.) He proposes to
refute the Principle of Bivalence by means of the following line of
thought:

> I can suppose without contradiction that my presence in Warsaw at a
> definite moment of time of next year, for example, noon of the twenty-
> first of December, is today decided neither in a positive or a negative
> sense. It is thus possible, but not necessary, that I shall be in Warsaw at
> the given time. On this assumption, the assertion, 'I shall be in Warsaw
> on the twenty-first of December next year,' can today be neither true
> nor false. For if it were today true, then my future presence in Warsaw
> would have to be necessary, and this contradicts the assumption; and if
> it were today false, then my future presence in Warsaw would have to
> be impossible, and this also contradicts the assumption. The proposition
> under consideration is thus today *neither true nor false* and must have
> a third value different from "0", or the false, and from "1", or the true.
> This value we can denote by "$\frac{1}{2}$". It is precisely "the possible," which as
> a third value takes its place along side of the "the false" and "the true."
>
> It is to this course of thought that the three-valued propositional cal-
> culus owes its origin.[6]

Lukasiewicz thus regarded fatalism as sufficient grounds for denying
the Principle of Bivalence, and this led him to draft a trivalent logic
for accommodating future contingent propositions. In this system if
any proposition $\alpha$ is false, then "it is possible that $\alpha$" is also false.
But if $\alpha$ is either true or $\frac{1}{2}$, then "It is possible that $\alpha$" is true. In
Lukasiewicz's opinion, this "agrees very well with our intuitions" con-
cerning modality.[7]

Many contemporary fatalists, whether theological or purely logical,
seem to have reservations about denying something so fundamental
as one of the traditional "laws of thought" like the Law of Excluded
Middle and welcome Lukasiewicz's distinguishing that Law from the
Principle of Bivalence, which, it is apparently thought, may be more
casually dismissed without serious consequences. Storrs McCall, for
example, after drawing Lukasiewicz's distinction, asserts that the Law
of Excluded Middle cannot be denied without absurdity, since by
DeMorgan's laws $(p \lor \sim p) \equiv \sim (p \cdot \sim p)$.[8] The best way to avoid
fatalism, he opines, is to deny that the Principle of Bivalence applies
to every future-tense proposition. Though he disputes the Taylor-
Cahn formulation of the fatalistic argument, he does think that the

following argument is sound, if Bivalence is assumed (letting T = true, F = false, M = possible, and $O$, $Q$ as before in Taylor's version):[9]

1.  $TQ \rightarrow \sim M \sim O$
2.  $FQ \rightarrow \sim MO$
3.  $TQ \vee FQ$
4.  $\therefore \sim M \sim O \vee \sim MO$

Here we cannot deny (1) or (2), states McCall, so we must deny (3), which is the Principle of Bivalence. The Law of Excluded Middle $(Q \vee \sim Q)$ need not be denied.

The situation is by no means so simple, however. In the first place, one must in denying the Principle of Bivalence make clear whether he is positing truth value gaps for certain propositions or ascribing some third truth value to those propositions. As Haack points out, these two alternatives are often conflated, the third truth value usually being called "neither-true-nor-false."[10] But the one alternative holds that the propositions in question have no truth value at all, while the other ascribes to them some quasi-truth, some degree of truth. Which of these alternatives one adopts will have profound consequences for his view of truth, as we shall see. Secondly, one has to make clear precisely what one understands by the Law of Excluded Middle, since the Law can be variously understood.[11] If we mean by Excluded Middle that $\alpha \vee \sim \alpha$ is included among the theorems of a system, then not only does Bivalence fail for Lukasiewicz's system $L_3$, but so does Excluded Middle. For any future contingent proposition $p$, the value assignment of $p \vee \sim p$ is $\frac{1}{2} \vee \frac{1}{2}$ and thus the whole formula is neither true nor false. The same holds for a truth functional system in which $\frac{1}{2}$ represents a truth value gap. At most Excluded Middle is preserved if we take the Law to mean that a proposition cannot be true and its denial fail to be false or its denial false and it fail to be true. We are then still unable to assert the truth of "The sea battle will or will not take place tomorrow," a statement which seems intuitively true. Moreover, if we take the Law of Contradiction to mean that $\alpha \cdot \sim \alpha$ is false, then that Law also fails for $L_3$. Since Lukasiewicz interpreted the value "$\frac{1}{2}$" as "possible," his system has the consequence that $(p \cdot \sim p)$ is possible, since the value of the formula is $\frac{1}{2}$. Similarly in a truth functional system of truth value gaps, $(p \cdot \sim p)$ is not false. The Law of Contradiction holds at most as an "exclusion principle" that $p$ and $\sim p$ cannot both be true together. But intuitively we should want to say that "The sea battle will and will not occur tomorrow" is false, which we cannot say in $L_3$ or in a system of truth value gaps. Thus, the denial of Bivalence for future contingent propositions carries with it a higher price tag than some fatalists seem to realize.

There are, of course, other many-valued systems than $L_3$, and in some of them $\alpha \vee \sim \alpha$ may hold. But, as Haack shows, one cannot hold to Excluded Middle and Tarski's (T) schema for truth (whereby it is true that $p$ iff $p$) and deny the Principle of Bivalence:

| | | |
|---|---|---|
| 5. $Tp \equiv p$ | (T) | |
| 6. $p \vee \sim p$ | (Law of Excluded Middle) | |
| 7. $p$ | (Assump.) | |
| 8. $Tp$ | (From 5, 7, by def. of "$\equiv$" and MPP) | |
| 9. $\sim p$ | (Assump.) | |
| 10. $T \sim p$ | (From 5, $\sim p/p$, 9, by def. of "$\equiv$" and MPP) | |
| 11. $Tp \vee T \sim p$ | (From 8, by vel introduction) | |
| 12. $Tp \vee T \sim p$ | (From 10, by vel introduction) | |
| 13. $Tp \vee T \sim p$ | (From 6, 7, 9, 11, 12, by vel elimination) | |
| 14. $Tp \vee Fp$ | (From 13, by def. of "F") | |

Haack concludes, "PB and LEM are distinct principles, either of which may be true of a system and the other false. If, however, LEM is a theorem of a system and (T) holds for that system, PB must also hold."[12] Hence, one can affirm Excluded Middle without Bivalence only by rejecting (T), which is a high price indeed.

Should some fatalists be prepared to abandon Excluded Middle, despite the counter-intuitive consequences of so doing, in order to retain (T), Haack proceeds to argue that (T) in itself entails the Principle of Bivalence except in the case in which the meta-language used to interpret the multivalent system employs itself a multivalent notion of "true." For example, in $L_3$, Lukasiewicz proposed the interpretation of 1, $\frac{1}{2}$, 0, as "true," "possible," and "false," the intermediate value being a truth value. That is to say, the Tarski schema commits one to Bivalence unless one is prepared to admit of degrees of truth. "If (T) is true of a system, PB will also be true of it, unless the interpretation of the intermediate value(s) of the system is such as to motivate adoption of a non-classical metalanguage, in which case (T) may be true but PB false."[13] It is far from clear, however, that the problem of future contingents provides any motivation at all for taking "true" to be multi-valued. There seems to be a popular misimpression that the very existence of multivalent logics demonstrates that the semantical Principle of Bivalence is false. This misunderstanding rests on a confusion between syntax and semantics, for the uninterpreted logical syntax implies nothing for the legitimacy of the semantical interpretation of that system in terms of propositions and truth values. As Williams emphasized, the many-valued logics of Lukasiewicz and others are "wholly abstract and uninterpreted schemes that do not even pretend to fit the ordinary meaning of the words, 'true,' 'false,' and

'not,' which meaning does accord with the law of excluded middle."[14] Charles Bayliss, in his excellent treatment of Lukasiewicz's fatalism and denial of Bivalence, explains that in two-valued logic, there is an abstract structure whose constituents are the values 0 and 1, the elements $p$, $q$, $r$, and so forth, and the relations $\sim$ and $\supset$. Can we find an interpretation for this structure? The usual one proposed is that the elements be regarded as propositions, the values 0 and 1 as falsity and truth, and the relations as negation and implication, respectively. In the same way, we have an abstract structure similar to the first except that there are three values, 0, $\frac{1}{2}$, and 1. There may or may not be an application for this structure. Thus, whether the Principle of Bivalence is true or false "is a question the answer to which depends on considerations quite other than those derived from the discovery or elaboration of abstract mathematical structures."[15] Is there then any feature of future contingent propositions that would motivate us to interpret a trivalent system in terms of three truth values? I cannot see that there is. At the most we might be moved to apply to them a trivalent system in which the intermediate value represents, not a truth value, but a truth value gap. But in that case, as we have seen, one will be forced to abandon Tarski's schema (T) along with Bivalence.

Still, some have been willing to take this step, denying (T) in order to retain Excluded Middle without Bivalence. Cahn, for example, affirms that $p \vee \sim p$ is necessarily true, but denies that either $p$ is true or that $\sim p$ is true, where $p$ is a future contingent proposition.[16] He defends his position by observing that $\square$ $(r \vee \sim r)$ does not imply $\square$ $r$ $\vee$ $\square \sim r$, nor does logically-$\square$ $(r \vee \sim r)$ imply physically-$\square$ $r$ $\vee$ physically-$\square \sim r$. Hence, he asks, does $\square$ $(r \vee \sim r)$ imply $Tr \vee T \sim r$? This latter formula implies fatalism: $(Tr \vee T \sim r) \supset$ (fatalistically-$\square$ $r$ $\vee$ fatalistically-$\square \sim r$). But $\square$ $(r \vee \sim r)$ implies only that it is not within someone's power to prevent my doing either $r \vee \sim r$. Thus, logically-$\square$ $(r \vee \sim r)$ does not imply fatalistically-$\square$ $r$ $\vee$ fatalistically-$\square \sim r$; but $Tr \vee T \sim r$ does imply this. Hence, logically-$\square$ $(r \vee \sim r)$ does not imply $Tr \vee T \sim r$. So, he concludes, one can say that while it is logically necessary that every proposition is either true or false, it is not true that every proposition must be either true, or if not true, then false. Cahn's discussion is obviously very confused, and it is difficult to understand how he means to interpret the truth of $\square$ $(r \vee \sim r)$, since his own statement of it is merely a reiteration of Bivalence, which he means to deny. His new modality "fatalistically-$\square$" is undefined and utterly opaque. Nor is it clear how logically-$\square$ $(r \vee \sim r)$ does not entail that necessarily $Tr \vee T \sim r$. In a reply to a critique by Tobias Chapman,[17]

Cahn simplifies his position by plainly asserting that he holds that the truth of $p \lor \sim p$ is not to be determined truth functionally.[18] He sees no reason why a three-valued logic must be so determined. Chapman had charged that on Cahn's view, the conjunction of any two future contingent propositions must be false. This Cahn denies, insisting that the truth of $p \lor \sim p$ does not imply the truth of $p \lor q$. The truth of the former derives from the fact that the propositions are contradictory, not from the fact that they are indeterminate, as is also the case with the latter. Cahn's reply seems to miss the point, however. Chapman's point seems to be that if $p \lor \sim p$ is non-truth functionally true for future contingent propositions, then since $q$ has the same value as $\sim p$ $(\frac{1}{2})$, it may replace it *salva veritate*. But since by De Morgan's Theorems $(p \lor \sim p) \equiv \sim (p \cdot \sim p)$, it follows that $\sim (p \cdot q)$, or that the conjunction of any two future contingent propositions is false. Cahn tries to avoid the absurdity by insisting that the truth of $p \lor \sim p$ is non-truth functional. By this, however, he must mean only in the case that the value of the disjuncts is $\frac{1}{2} \lor \frac{1}{2}$, otherwise chaos would result (for example, $[0 \lor 0] = 1$). But unless he proposes to make first order logic non-extensional as well as non-truth functional, it must be allowed that $q$ may be substituted for $p$, in which case Chapman's conclusion follows. The truth of $p \lor \sim p$ cannot be said to derive from the fact that the propositions are contradictories, since this would entail that in this case "$\lor$" and "$\sim$" are, after all, truth functional. Cahn's stipulation that only disjunctions of the form $p \lor \sim p$ shall be true is therefore arbitrary. He does not, however, draft any system in which this formula is an arbitrary theorem and the operators are otherwise truth-functional.

This lack is remedied by Thomason, however, who draws upon the trivalent system of Van Fraassen to allow for the indeterminacy of future contingent propositions while preserving the Law of Excluded Middle.[19] His system depends on the notion of supervaluation, whereby a compound proposition made up of components lacking a truth value nevertheless receives that truth value which would be assigned to it by classical valuations if there be such. Thus, if $p$ and $q$ are propositions representing truth value gaps, then $p \lor \sim p$ would be assigned the truth value T, since in classical logic such would be its value, but $p \lor q$ would be truth valueless, since no value is mandated by classic valuations for such a formula. Van Fraassen's system is non-truth functional, therefore, and Tarski's principle does not hold as an implication: it is false that for all $\alpha$, $\alpha \supset T\alpha$. Thomason maintains that Van Fraassen's system is well-suited for capturing what he takes to be Aristotle's position with regard to future contingent

propositions, namely, that in an *antiphasis* of such propositions neither is individually true, but Excluded Middle holds for the entire disjunction. Whether Thomason's solution is attractive or not hinges, as Haack points out, on the plausibility of the principle that a wff should be assigned a value "V" if it would be assigned that value by a classical valuation whether its components were true or false.[20] But, she demands, if it is supposed that some wff have no truth value, why should the fact that compounds of these *would* have a certain truth value independent of the truth value of the components be any reason for giving the compounds that value anyway? Van Fraassen's principle is plausible *precisely on the assumption* that the components do have truth values, though these be perhaps unknown. But it seems implausible and unwarranted to assign to a compound of truth valueless components any value rather than to regard it, too, as a gap.

Thus the denial of the Principle of Bivalence with regard to future contingent propositions involves a higher price in counter-intuitive consequences than is sometimes realized, and one must question whether the problem of future contingents provides a plausible interpretation of three-valued logics. One need not weep for multivalent logic should the answer be negative, for there are numerous other areas of possible interpretation. Rescher furnishes a list of possible applications in three broad areas:[21]

I. Abstract Contexts in Logic and Mathematics

1. serving as a tool for providing demonstrations of non-provability, axiom independence, and consistency in the metalogic of axiomatizations of propositional logic

2. studying decideability of numerical predicates in the mathematical theory of partial recursive functions

3. studying modal logics

4. resolving semantical paradoxes [an application which Rescher regards as unsuccessful]

5. avoiding paradoxes of the mathematical theory of sets [also deemed unsuccessful]

II. Physical Applications

6. characterizing the quantum theory of indeterminacy

7. reconciling the conflict of alternative theories that yield contradictory results (for example, the photon understood as either a wave or a particle)

8. characterizing switching circuits

III. Philosophical

    9. resolving the problem of future contingency and truth

    10. analyzing the status of the Laws of Thought

    11. understanding the nature of logic itself

Just as the application of multivalent logic to semantical and set theoretic paradoxes proved unsuccessful, the counter-intuitive consequences of applying such logics to the problem of future contingencies may give us good reason to doubt whether this interpretation is a successful application of such logics. One or some of the several other areas above may well prove to yield more successful semantic interpretations of these systems.

<div align="center">

Grounds for Denying Bivalence
of Future Contingent Propositions

</div>

*Fatalism*

Indeed, it needs to be asked, what good reason is there, after all, for denying the Principle of Bivalence with regard to future contingent propositions?[22] "To avoid fatalism" seems to be the primary reason given by most would-be fatalists. This, however, is surely inadequate, for such a denial is then entirely *ad hoc*. There is no independent reason to think that future contingent propositions are neither true nor false; one simply does not *like* the alleged consequences of such propositions' being bivalent. But disdain for fatalism can hardly warrant rejection of Bivalence with regard to such propositions independent of any further justification. It might be said that fatalism is incoherent, that it cannot be true, and that the most likely candidate in the fatalistic argument to be rejected is the Principle of Bivalence. Now I agree that fatalism is unintelligible; but this is no reason to make the Principle of Bivalence the scapegoat. Rather we ought to suspect that the guilty culprit in this affair is the peculiar notion, with all its ramifications, of "within one's power" employed by the fatalist. For the explanations given of this concept tend, as we shall see, to reduce to one's inability to do the logically impossible. Here the constraints upon one's action are purely logical; for example, it is not within my power to marry yet remain a bachelor. Yet such a constraint can hardly be deemed as an infringement of my freedom. The fact that the fatalist's case reduces to such a non-causal constraint upon my freedom casts doubt, not on the Principle of Bivalence, but on his conceptions of power and necessity. A discussion

of those notions may be reserved until later; for now it is enough to conclude that a denial of Bivalence under the threat of fatalism is *ad hoc* and unwarranted, and insofar as fatalism is deemed incoherent, such unintelligibility only serves to call into question the fatalist's notion of power, not the Principle of Bivalence. Therefore, the threat of fatalism constitutes insufficient grounds for rejecting Bivalence with regard to future contingent propositions.

*Correspondence and the A-theory*

Many fatalists do, however, furnish independent reasons for regarding future contingent propositions as neither true nor false, reasons which are intimately related to one's philosophy of time and becoming. Fatalistic opponents of Bivalence, notably Prior and McCall, often adhere to a view of time according to which the future is not on an ontological par with the present, that is to say, future events do not in any sense exist, and therefore propositions concerning them, or at least concerning those events which are causally indeterminate, are not now true or false. Proponents of this view are thus heirs to the characterization of time expressed in McTaggart's A-series, in which events are primarily classed as past, present, and future, as opposed to the B-series, in which events are classed as merely earlier and later. To these competing characterizations of temporal series a number of theses have come *de facto* to be related, as Chapman outlines:[23]

| A - Theory | B - Theory |
|---|---|
| a. Logic ought to include tensed quantifiers for existence; more generally, all tensed locutions cannot be reduced to tenseless ones. | a. Tensed locutions to the extent that they are correct at all can be reduced to tenseless ones; existence is adequately expressed by the ordinary quantifier plus dates. |
| b. The distinction between past, present, and future is objective and not dependent on our consciousness of change. | b. The distinction between past, present, and future is subjective; the "now" is simply the time of which we happen to be conscious. |
| c. Time is asymmetrical in a number of respects; e.g., (i) there are ontological differences between past, | c. The asymmetry of time is weaker than A-theorists claim, consisting in local entropy increases; the only genuine |

present, and future;                    causal relation is
(ii) hence reference to past            symmetrical.
and present individuals is
logically different than to
future individuals (i.e.,
proper names cannot be assigned
to not yet existent particulars);
(iii) indeterminism is true of
the future, but not of the past;
(iv) causal chains propagate
only from the present to the
future.

d. Space and time are not              d. The spatial and temporal
exactly analogous; hence,              parts of an individual can be
individuals are not four-              treated in logically similar,
dimensional solids.                    if not identical, ways.
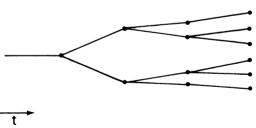
e. There is such a thing as            e. Temporal flow is either
objective becoming, and real           altogether mythical or
change requires this.                  subjective.

It is far from obvious, however, that all the related respective theses are entailed or implied by the A- or B-theories of time; indeed, Chapman argues that they are not. Our interest lies therefore not in assessing the adequacy of the A- or B-theory, but in analyzing the purported connection between the characterization of time as an A-series and the denial of Bivalence for future contingent propositions.

McCall defends the denial of Bivalence for future contingent propositions, claiming that this allows us to introduce time's arrow, temporal passage, and the happening of events into the four-dimensional world of modern science.[24] By denying Bivalence we may speak of a proposition's being true [or false] at a certain time and not at others. To say $p$ is true at $t$ means merely that if someone uttered $p$ at $t$ he would be saying something true. The B-theory implies that all tensed propositions with definite temporal indexicals are true or false. But McCall disputes this, arguing by means of illustrations that future contingent propositions are not true or false.[25] For example, horse race predictions when made are not true or false. Or consider the case of a doctor, who, administering medicine to a patient says, "*Now* he'll get better." On the B-theory one would have to say that it was always true that he would get better. But according to McCall, when the doctor gave the patient the medicine a new causal factor was introduced, and we cannot say beforehand that the doctor would give

him the medicine because it was not until the last moment that the doctor decided to do so. Thus, we are, in McCall's opinion, forced to say that the doctor's pronouncement was neither true nor false before he administered the medicine. In a later piece McCall describes his theory of time as an "objective model of temporal becoming."[26] The future is at any point like a tree, the trunk representing the actual past and the branches the alternative possible future courses of events. There is no branching of the past because the past is unique; while we may not *know* which alternative past occurred, there is ontologically (as opposed to epistemologically) only one past. If the universe were causally deterministic, then there would be a unique future as well. The universe tree would have no branches, and a single picture of the universe would be valid for all times. On this proposed theory of time, therefore, future contingent propositions are neither true nor false; a future-tense proposition is true if the event described occurs on all branches, that is to say, is causally determined by conditions existing in the current trunk of the universe tree. Hence, although the Principle of Bivalence necessarily holds for past-tense propositions, it holds only contingently for future-tense propositions, namely, only in case they describe causally determined states of affairs.

Philosophers working in temporal logic often express similar views. Thus Rescher and Urquhart conceive of the open future in terms of branching structures, where each branch is a possible world history and each node an event:



Any event $Ey$ is determined with respect to an event $Ex$ if there is no possibility of a "branching off" in proceeding from $Ex$ to $Ey$, that is to say, if either $Ey$ lies in the past of $Ex$ or one does not, in tracing a path from $Ex$ to $Ey$, encounter any fork in the path. If $Ey$ is not determined with respect to $Ex$, then it lies in the open future of $Ex$: it is contingent whether, once arrived at $Ex$, we ever get to $Ey$ at all. Thus, $Ex$ has, not a uniquely possible future, but different alternative futures. "And this is not an epistemological matter inherent in our knowledge or ignorance of the course of events in such a world, but an

ontological matter inherent in the type of causal structure governing its 'course of events.' "[27]

As they begin to work out the implications of this model for the Principle of Bivalence, however, inconsistencies gradually emerge:

> On our view, . . . the infeasibility of making definite assertions about future contingence [sic] inheres in the (causal) impossibility of specifying the outcome of branching events, and is thus a matter not of the nature of time itself, but of the natural laws governing the course of events in time. It is thus plausible to characterize a future contingency as true or false (albeit one cannot say which). The (temporally definite) future contingent proposition $p$ is, even as of $n$, either true or false, (whatever ultimately turns out), although it does not yet (i.e., at $n$) possess this truth value in a *determinate* way, but only acquires a determinate truth value after $n$. On this view of the matter, the contingency of the future thus inheres in the causal structure of the course of events, not in the nature of time as such.[28]

Here their view differs from McCall's, for future contingent propositions are held to be true or false based on what eventually turns out, though they are not determinately true or false. Unfortunately, the conception of "determinate truth" is not explained. However, in a subsequent discussion of Diodorus' Master Argument, they assert that the best way to avoid fatalism is to reject the Law of Excluded Middle in the context of a temporally relativized conception of truth.[29] Advocating the use of a three-valued conception of temporal truth, they maintain that future contingent propositions are indeterminate and then become true. A future-tense proposition may be definitely true or definitely false or neither of these, thus occupying a truth status that is indeterminate or neutral. Their position now sounds very much like Aristotle's, which entailed the denial of Bivalence with regard to the truth value of future contingent propositions. Furthermore, in discussing "Alternative Futures and Future Contingency," they distinguish three modes of futurity:

> 1. Future actuality: a proposition will obtain in this mode if it is true in the actual possible future.
>
> 2. Future possibility: a proposition will obtain in this mode if it is true in any one possible future.
>
> 3. Future necessity: a proposition will obtain in this mode if it is true in each and every possible future.

Mode (1) is rejected because "We cannot defensibly speak of 'the actual future' of any juncture because—with respect to that juncture—that future is wholly undefined and so indeterminable. And there is not . . . and never will be a way of specifying any one branch as 'the actual one.' "[30] Hence, future-tense propositions can possess only

either the mode "possible" or the mode "necessary." This analysis
seems to suggest that future-tense propositions may be necessarily
or possibly true (or false) but cannot be contingently and actually
true (or false). How surprising is it, therefore, when Rescher and
Urquhart commit themselves to the "medieval solution" as the best,
that future contingent propositions do not lack a truth status as such,
but do lack a "determinate truth status," this latter phrase now to
be understood in the following way: a proposition $\alpha$ is determinately
true or false at time $t$, with respect to a set $L$ of natural laws, if it is
possible in principle to deduce $\alpha$ or $\sim \alpha$ from the body of information
comprised of (1) logic and mathematics, (2) the set of laws $L$, and
(3) the complete history of the world up to and including $t$! Given
this, if we can settle the question of truth or falsity for $p$, then $p$ has
a determinate truth value at $t$.[31] Here we discover that a proposition
is determinately true if the corresponding state of affairs is causally
determined at the present time. Thus, Rescher and Urquhart's anal-
ysis in no way challenges Bivalence. Future contingent propositions
are true or false, but we simply cannot know which because the cor-
responding states of affairs are not empirically predictable. Thus,
to say that a future contingent proposition is not determinately true
or false is just a mysterious way of reiterating that it is contingent.
According to Rescher and Urquhart, what makes such propositions
antecedently true or false is, not how things are, but how things will
turn out:

> . . . the issue of truth or falsity hinges entirely upon *how matters
> turn out at the time at issue*, so that the allocation of a truth status
> to future contingents is perfectly innocuous, because it prejudges noth-
> ing. No suggestion is intended that the truth status a future contingent
> proposition certainly *has* at times prior to the time of reference can be
> *specified* at these earlier times without any reference to 'how matters
> turn out.'[32]

Whether a proposition is true or false thus has nothing to do with
whether we can specify on the basis of present conditions which truth
value it possesses. Future contingent propositions are true or false be-
cause of how matters will turn out, but they are not "determinately"
true or false because their truth value is not determined by causal
conditions which presently obtain.

Unfortunately, Rescher and Urquhart muddy the waters when they
go on to declare, "The truth-status of a future contingent proposition
is made to hinge upon what happens at the future time: there is no
suggestion that its *having* a truth-value, and an (ultimately) know-
able one, in any way fixes beforehand or pre-determines what that
truth-value is to be."[33] This seemingly unintelligible statement must

either be a slip (the intention being that the antecedent truth value does not pre-determine what the event is to be) or be perhaps a very awkward way of introducing the notion that propositions with definite temporal indexicals are timelessly, not antecedently, true. For the authors proceed to assert that a temporally definite proposition can only be true or false and cannot properly be said to be true or false at a time $t$. They claim that to say "Caesar crossed the Rubicon" is true now is as silly as to say it is true here. Their final position seems to be that future contingent propositions can be regimented to yield a canonical form having a tenseless verb and definite temporal indexicals, but that the determinateness of the truth of such propositions is a function of time:

> . . . while the truth-status of a temporally definite proposition is not a function of time, the *determinability* of that truth-status of course will be, and so the situation changes completely when . . . we speak of determinate or determinable truth. For if the universe contains . . . contingently free actions in the organic sphere then there will be propositions whose truth-status is *for ontological reasons* undeterminable prior to the event . . . . the step *from truth or falsity pure and simple* to determinable truth or falsity lays the foundation for a conception of truth-standing that is quite legitimately a function of time.[34]

This position, however, contradicts both their earlier explanation that a temporally definite proposition is omnitemporally, not timelessly, true[35] as well as their aforecited statements to the effect that future contingent propositions have truth value at times antecedent to the obtaining of their corresponding states of affairs. Nothing that they have said justifies taking their canonical form of future contingent propositions as timelessly true rather than true at all times, and, hence, antecedently true. Moreover, their final position puts their earlier remarks in a very different light. For now we see that their denial of Excluded Middle concerns, not the truth value of future contingent propositions, but their determinate-ness. This, however, says nothing against fatalism, as they allege, but only serves to deny causal determinism. Furthermore, the mode of future actuality is now seen to characterize true future contingent propositions—our inability to specify which causally contingent branch constitutes the actual future is irrelevant. A more consistent version of their theory would hold that while the future is in part causally indeterminate and while, therefore, the course of future events may follow alternative branches, still future contingent propositions are antecedently true or false, based, not on present conditions, but on which future branch *will* be taken, even though we cannot now determine, even in principle, which branch the future course of events will take.

In any case, Rescher and Urquhart's analysis is, despite its inconsistencies and ambiguities, valuable because it suggests that an A-theory of time does not after all entail a denial of Bivalence for future contingent propositions.[36] McCall's arguments to the contrary can hardly be said to force us to that denial, as McCall believes. Horse race predictions are in fact true or false, but they are contingent, so that their truth or falsity cannot be empirically determined.[37] In the case of the doctor, it has always been true that "The patient will get better after the doctor administers the medicine," but this obviously does not mean that the causal conditions for his improved health have been existent from eternity. We may say truly "The doctor will administer the medicine at $t_n$" prior to $t_n$; as for his last minute decision, we may also say truly, "The doctor will decide at $t_{n-1}$ to administer the medicine at $t_n$". All these future propositions are causally contingent, but McCall has not shown that they are therefore neither true nor false. Contrary to McCall, a future-tense proposition is not simply true if the described event occurs on all future branches; it is then necessarily true, and if the event occurs on at least one branch the proposition is possibly true, and if it occurs on the branch which the future will follow, then the proposition is in fact true. The view espoused by McCall, that only necessary future-tense propositions are true entails counter-intuitive consequences, as we shall see.

It seems to be a perennial error on the part of A-theorists wishing to avoid fatalism to hold that in order for a proposition to possess a truth value, the reality corresponding to the proposition or the causal conditions sufficient for the coming to be of the corresponding reality must actually exist at the time of the truth of the proposition.[38] No reason has been given to justify this assumption. It might be thought to follow from a view of truth as correspondence, since no future reality exists to which future contingent propositions correspond. But this would also seem to require that causally necessary future-tense propositions also lack truth value, since their corresponding reality does not yet exist. But typically such propositions are regarded as true or false. An A-theorist appealing to truth as correspondence would be more consistent to deny Bivalence for all future-tense propositions.

The A-theorist might rejoin that correspondence requires either that the corresponding reality exist or that the causal conditions sufficient for the corresponding reality exist and that therefore some future-tense propositions are true. The unfortunate consequence of this, however, seems to be that a future-tense proposition could be true at $t_1$ and false at $t_2$ still prior to the coming to be of the cor-

responding reality at $t_3$. For while the sufficient conditions for, say, a lunar eclipse might exist at $t_1$, these could be altered by the intervention of free agents at $t_2$, say, lunar thermonuclear testing affecting the moon's orbit, so that the sufficient conditions no longer exist. It cannot be said that the sufficient conditions at $t_1$ include the nonintervention of free agents, since this would refer to future contingent states of affairs, of which no true proposition may be asserted. Hence, it seems that the consistent A-theorist appealing to truth as correspondence is bound to deny Bivalence for all future-tense propositions.

He might propose at this point a variation of the A-theory in which certain stretches or events of the future do exist, but in which the future is a lattice-like structure riddled with holes where contingent acts occur. This seems, however, incoherent; for on the one hand the dynamical view of time captured by the A-theory is abandoned, since the future is in part on an ontological par with the past, and yet an attempt is made to preserve absolute becoming as the lattice-work is gradually "filled in" by the advance of the present and the progress of events.[39] Thus, it seems that the consistent A-theorist appealing to truth as correspondence ought to deny that any future-tense proposition is true or false. But we have seen that a denial of Bivalence for any future-tense proposition based on truth as correspondence is a *non sequitur*, for that view only requires that reality *will* correspond to the description given in a future-tense proposition, not that it *does* now correspond.

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Grounds for Affirming Bivalence
of Future Contingent Propositions

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Moreover, there are, in fact, good reasons for affirming Bivalence for future contingent propositions. For (i) the same facts which serve to make past- and present-tense propositions true also serve to make the relevant future-tense propositions true. As Rescher comments in another place,

> Difficulties about divine foreknowledge quite apart, it is difficult to justify granting to
>
> (1) 'It will rain tomorrow' (asserted on April 12)
> a truth status different from that of
> (2) 'It did rain yesterday' (asserted April 14)
> because both make (from temporally distinct perspectives) precisely the same claim about the facts, viz., rain on April 13.[40]

The reasoning recalls Aristotle's argument that if it is now true to say, "This is white," then in the past it must have been true to say, "This will be white"—an argument which Aristotle never answers. Moreover, (ii) if future-tense propositions are neither true nor false, then neither are past-tense propositions. As Bayliss points out in his critique of Lukasiewicz, the assumption that a view of truth as correspondence precludes future-tense propositions' being bivalent would also require that past-tense propositions are neither true nor false, since their corresponding states of affairs no longer exist, a consequence no one would embrace. For just as the events corresponding to past-tense propositions no longer exist, so the events corresponding to future-tense propositions do not yet exist. "For the truth of propositions to the effect that certain events did occur in the past it is necessary only that the occurrence of these events was at the time specified a fact, and, similarly, for the truth of propositions to the effect that certain events will occur at a given time in the future it is necessary only that the occurrence of these events at that time will be a fact."[41] Now someone might propose a variation of the A-theory in which only the past and present is conceived to exist, so that only propositions in those tenses may be held to be true or false. Such a move, however, is incompatible with the A-theory because then events which are to us present are future but nevertheless existent to persons who exist in our past, a view which is characteristic of the B-theory. To such persons, the future is on an ontological par with their present and past up to the moment which is our present. Worse still, their real future grows as the moment of the present advances, which seems incoherent, since a person at $t_n$ cannot be said to have different ontologically real futures at different times. Hence, on an A-theory of time, if future-tense propositions lack truth value due to lack of current correspondence, so do past-tense propositions.

To these considerations might be added (iii) that the tenseless versions of future contingent singular propositions would seem to be always true or false. Thus, Talbott argues that even though it is "futile" and "self-contradictory" to try to reduce tensed sentences to tenseless ones without meaning loss, still the tenseless propositional versions of such sentences are timelessly true or false and, while not equivalent in meaning to such sentences, are logically equivalent.[42] One could allow, he admits, that some genuine propositions are tensed; but the crucial issue is whether a tenseless proposition is true or false timelessly. Contrary to Aristotle, one need not adopt the view that tenseless propositions become true or false on the ground that the truth of propositions depends on the state of the world. Rather one

may hold that the truth value of tenseless propositions about the future depends on the future. To say such a proposition "becomes true" at $t_n$ is an elliptical way of saying that the event which makes it true takes place at $t_n$. Talbott's thesis is that every proposition of the form, $S$ does A at $t$, is timelessly true, if true, and timelessly false, if false. The merit of Talbott's defense of the timelessness of truth is that he does not claim that all propositions can be regimented into a tenseless canonical form without loss of meaning; his more modest claim that *some* propositions are tenseless and that these include propositions about future events seems undeniable. Moreover, if we understand "timeless" to mean "omnitemporal," his claim that such propositions are timelessly true seems entirely plausible. For if "$x$ occurs at $t_n$" is ever true, it would seem to be *always* true, since the proposition is tenseless. Hence, Bivalence holds for such tenseless propositions. Since such a tenseless proposition concerning any future contingency can be framed, it follows that propositions concerning future contingencies are true or false.

The error of which the A-theory fatalist seems to be guilty in denying the Principle of Bivalence is conflating the alethic and epistemic statuses of future contingent propositions. He seems to think that because we cannot know such propositions to be true or false they therefore cannot be true or false. But as Bayliss points out, this is a *non sequitur*:

> What is needed in order that the proposition, 'Lukasiewicz will be in Warsaw at noon on the 21st of December of next year,' should be true is only that at the time specified it will be a fact that he will be there. Whether there are now any facts which determine the facts which will be at that time is another question, a question the answer to which will be relevant to the truth or falsity of determinism. Unless there are such facts and unless they are known, *knowledge* of the future may well be impossible. But such facts are not essential to the *truth* of propositions about the future.[43]

Oddly enough, Prior admits as much: in his response to the Ockhamist he grants, as we have seen, that it is intelligible to speak of a contingent statement's being true yesterday, but he doubts that it is intelligible to say that it was known yesterday. "For there would be *ex hypothesi* nothing that could make it knowledge, no present ground for the guess's correctness which a specially penetrating person might perceive."[44] In so saying, Prior gives away his case for denying that future contingent propositions can now be true and his earlier attempt to apply three-valued logic to the truth status of such propositions. Instead, it seems that, as Rescher and Urquhart suggested, a legitimate application of three-valued logic concerns, not the

truth value of such propositions, but their epistemic status. One could interpret the values "1," "$\frac{1}{2}$," "0" to mean "determinably true," "indeterminable," "determinably false," the term "determinable" being understood to mean "empirically adjudicable."[45] In this way, future contingent propositions would possess truth value, but one could not determine empirically what that truth value is. This, it seems to me, is the proper role which a multivalent logic could be conceived to play in the issue of future contingents. But the A-theory of time in no way entails that future contingent propositions escape the Principle of Bivalence insofar as their truth value is concerned; on the contrary, we have seen that there are plausible grounds for regarding such propositions as either true or false.

Therefore, it would appear that neither the threat of fatalism nor an A-theory of time justifies regarding future contingent propositions as neither true nor false. To reject Bivalence under the threat of fatalism would be *ad hoc*, and the A-theorist can hold quite consistently to the unreality of future things and to the bivalent truth value of future contingent propositions, since these are true or false, not on the basis of what *is* ontologically real, but what *will* be ontologically real. Indeed, there is good reason to regard all future-tense propositions as either true or false, since it is difficult to see how the future-tense version of a present- or past-tense proposition would not have been antecedently true in virtue of the same facts, since a denial of Bivalence for future-tense propositions based on truth as correspondence would entail a denial of Bivalence for past-tense propositions as well, and since tenseless propositions concerning future contingents would seem to be always true or false. A legitimate interpretation of multivalent logic for future contingent propositions might concern, therefore, not their alethic status, but their epistemic status.

## Bivalence of All Propositions

Finally, it needs to be called into question whether there is any good reason *at all*—wholly apart from considerations of future contingents—for denying the Principle of Bivalence. Here it must be recalled that multivalent logics are uninterpreted systems, having no inherent connection with truth. Zinov'ev reminds us,

> . . . the truth values are here normally defined as a set of symbols (normally of numbers); it is an idle question as to which meaning each of these symbols has by itself, independently of possible interpretations and of the conveniences of the calculi. The following example shows quite clearly that the terms 'true,' 'false,' 'undetermined,' etc. are here not defined, but are only replaced by terms from a concrete domain.

We make a contact $a$ correspond to a proposition $x$, and one of the contact's possible positions $i$ (it is indifferent which one) to truth. Under this interpretation, the proposition '$x$ is true' has as a translation in the language of the given object domain the expression 'the contact $a$ is in the position $i$'. Thus it is immaterial which truth value we let correspond to the position $i$; we could as well have chosen falsity.[46]

Since the values "1," "$\frac{1}{2}$," "0" and so forth have no inherent reference to truth as we ordinarily conceive it, multivalent logics provide in themselves no grounds for denying semantic Bivalence. In fact, as Bayliss argues, it is plausible to regard truth as necessarily bivalent. For the Principle of Bivalence (or, as Bayliss calls it, the Law of Excluded Middle) to be true, it is necessary only that the division of propositions into true and false should be exhaustive; whether it is depends on the meaning of the terms "true," "false," and "proposition." The meaning of these terms is clear enough to make the fact that this division is exhaustive "one of the most certain things about them."[47] For this division is intended to be a dichotomy: to assert that a proposition is false is to assert that it is not true and to assert that it is not true is to assert that it is false; to assert that a proposition is true is to assert that it is not false and to assert that it is not false is to assert that it is true. Thus from the very meaning of the terms, it follows that every proposition is either true or false, which is the Principle of Bivalence. Accordingly, those areas of possible application proposed above which entail a denial of the semantic Principle of Bivalence would seem to be illegitimate interpretations. For example, Bayliss maintains that it would have been better for intuitionist mathematicians following Brouwer to deny that certain formulations in mathematics are propositions at all, rather than deny Excluded Middle. These considerations suggest that only those interpretations of multivalent logics which do not deny semantic bivalence (such as switching circuits or modal propositions) are legitimate interpretations of these systems. In conclusion, the oft proffered solution to fatalism of denying the Principle of Bivalence or the Law of Excluded Middle does not seem viable. Whether one posits a third truth value for such propositions or truth value gaps, counter-intuitive consequences follow. Accordingly, other areas of application and interpretation than the truth status of future contingent propositions ought to be sought. No good reason exists for denying Bivalence of future contingent propositions, except insofar as their epistemic status may be concerned. Instead we saw positive reasons for supposing such propositions to be true or false. Finally, we have seen reason to question whether there is any warrant for denying semantic Bivalence at all. The upshot of this discussion is that one cannot plausibly escape

logical fatalism by denying Bivalence or Excluded Middle nor can one avoid theological fatalism by interpreting omniscience as restricted to past-, present-, and causally necessary future-tense propositions.

*Falsity of All Future Contingent Propositions*

Logical Form of Future Contingent Propositions

Some fatalists, notably Prior, have taken a different tack in seeking to escape the threat of fatalism: they maintain that the propositions in question do not really have the form which they appear to have. The grammatical form of future contingent propositions is said to differ from their logical form. Thus, Prior maintains that it is ambiguous whether the negation of

15. It is the case that there will be a sea battle tomorrow ($Fp$)

is

16. It is the case that there will not be a sea battle tomorrow ($FNp$)

or

17. It is not the case that there will be a sea battle tomorrow ($NFp$)

According to Prior, (15) is false, (16) is false, and (17) is true. So understood, future contingent propositions are indeed bivalent, and any affirmative such proposition is false. Therefore, for any future contingent proposition the Law of Excluded Middle *does* apply: $p \lor \sim p$. Since $p$ (in some sense of [17]) is always true, the entire disjunction is true.[48] The only true affirmative future-tense propositions are the causally necessary ones, and the only negative future-tense propositions (in sense [16]) which are true are causally impossible ones.

What grounds can be given for regarding (15) and (16) as both always false? It is insufficient, as we have seen, to assert that any future contingent proposition $p$ can be true only if there exists some present fact which makes $p$ true, for it is what will be the case, not what is the case, that furnishes $p$'s truth conditions. In this regard, Prior treats his tense logical operators rather loosely, for they were introduced as substitutes for the tensing of $p$. Hence, (15) - (17) should read:

15´. It will be the case tomorrow that a sea battle takes place.

16′. It will be the case tomorrow that a sea battle does not take place.

17′. It will not be the case tomorrow that a sea battle takes place.

By employing "it is the case" Prior creates the impression that there are some present existents which make $p$ true. Thus, he claims that with regard to future decisions, there is "a gap in the facts:" it is not yet the case that I am going to do $x$ or not do $x$.[49] According to Prior, my decision is needed to make one of these the case, and if it is not yet the case that I shall do $x$, then it cannot be known that I shall do $x$. Such usage of the operators, however, is inconsistent with Prior's original explanations of them. "It is the case" is vacuous, so that "It is the case that I am going to do $x$" reduces to "I am going to do $x$." The proper formulation of this proposition is "It will be the case that I do $x$." In this case, there is no "gap in the facts," for the proposition is true iff it *will be* the case that I do $x$. "Being the case" serves to express states of affairs that obtain in the actual world. To say "It was the case that $p$" expresses the fact that the state of affairs $S$ corresponding to $p$ obtained in the actual world prior to the present moment, and "It will be the case that $p$" expresses the fact that the relevant state of affairs $S$ will obtain in the actual world in the future. We may not know whether $S$ will obtain or not, but such epistemic considerations are irrelevant to the truth value of "It will be the case that $p$," which depends solely on whether or not $S$ *obtains* in the actual world. Similarly, "It will not be the case that $p$" is true iff it will not be the case that $S$ obtains; it expresses the fact that $S$ does not obtain in the actual world. Accordingly, (17′) implies that no sea battle takes place tomorrow. Hence, neither (16′) nor (17′) serves Prior's purpose of formulating a contradictory of (15′) which is always true and does not entail the truth of future contingent propositions. Rather Prior must regard

18. It is not the case that it will be the case tomorrow that a sea battle takes place

as the proper contradictory of (15′).[50] But given the ambiguity of the tense logical operator, "it is the case," what reason is there to regard (18) as the contradictory of (15′) rather than (16′) or (17′)? Moreover, "it is not the case" expresses in (18) no gap in the facts, for what is or is not the case about what will be the case depends entirely on what will be the case. Hence, no reason has been given as to why we should regard contingent propositions of the form "It is not the case that it will be the case that $p$" as always true.

## Unidentifiability of Future Individuals

Prior is ready with a rejoinder, however: propositions of the form "It will be the case that $p$" cannot be true where p describes some as yet non-existent individual because it is impossible at the present time to identify such individuals.[51] Taking his cue from Aquinas's doctrine that prior to creation God had the power to make a world but there was nothing that had the power of being made, Prior asserts that

19. Once $x$ was not and now it is

cannot mean:

20. Once $x$'s non-being was the case and now its being is,

but can only mean:

21. It is not the case that $x$ was, but it *is* the case that $x$ *is*.

Thus, for example, there can be no question of God's grabbing hold of Caesar and launching him into being from nothingness. Things are not brought into being. Caesar is Caesar only after he has begun to exist. After Caesar's birth, the proposition, "*This man* could have had other parents" is logically possible; but prior to his birth there were no logical possibilities concerning Caesar. Logical possibilities increase as the number of individuals increase. Hence, it *was* not logically possible that Caesar should come to have other parents, but it *is* logically possible that he should have had other parents. There can therefore be no truths about individuals until there are such individuals to be subjects of those truths.

Once again, however, Prior's lack of rigor in his use of tense logical operators seems to have led to confusion. For (19) means:

22. It was the case $n$ time units ago that $x$ is not, and (it is the case that) $x$ is.

But (22) in no way entails the existence of some possible, but unactual object $x$. As Plantinga has explained, one must distinguish between "$x$ has the property of non-existence" (cf. [20]) and "it is false that $x$ has the property of existence."[52] The former is necessarily false, but in worlds in which x does not exist the latter is true. Therefore, "$x$ does not yet exist" and "it will be the case that $x$ exists" do not entail the existence of some possible, but unactual object x. There is no question of God's launching such an object into actual existence.

Work on possible world semantics and trans-world identity since the time of Prior's writing has served to alleviate the misgivings he expressed concerning individual identity prior to the actual existence of the individual. Prior to creation, there were any number of possible worlds containing Caesar which God could actualize, and Cae-

sar's identity between worlds is simply a matter of stipulation of an individual essence and tracking it. Such semantics need not commit one to any metaphysical theses: possible worlds may simply serve heuristically to convey the fact that prior to creation it was logically possible for God to create one of any number of various universes, in which the same individuals might have or lack certain properties. Prior's view, on the other hand, entails the consequence that prior to creation, no universe—not even the actual one—was a logical possibility, which is outrageous. As for the use of indexicals such as "this" or "that," Prior's concern appears to have been that prior to his existence no person can be picked out by such a designation;[53] but there seems to be no reason why these indexicals may not be used of individual essences prior to their exemplification. Contemplating a possible world $W$ containing some individual essence $x$, God may decide, "I shall not actualize that essence in the actual world."[54] In a work cut short by his death but posthumously published in a reconstructed form by Kit Fine, however, Prior had intended to modify and advance his case against the application of Excluded Middle to non-actual individuals.[55] As Fine points out, Prior was committed not only to the thesis that only actual objects exist, but also to the view that only present objects exist.[56] In Prior's thinking, if Excluded Middle failed for propositions about non-actual individuals—or, better, that there are no propositions about such individuals—, then the same would be the case for individuals who will be, but are not yet, actual. Hence, he claims that in a world and at an instant from which an individual is simply absent, there are neither facts nor falsehoods about that individual. Given any individual $x$ and predicate $P$, the Law of Excluded Middle dictates that either it is true of $x$ that it is $P$ or it is true of $x$ that it is not $P$. But given any proposition $p$ and a possible would $W$, we cannot be sure that either it is true in $W$ that $p$ or it is true in $W$ that $\sim p$, for in $W$ there might just be no such proposition as $p$ and so no such proposition as $\sim p$. Similarly, given any tensed proposition $p$ and instant $t$, we cannot be sure that either it is true at $t$ that $p$ or it is true at $t$ that $\sim p$, for at $t$ there might just be no such proposition as $p$ and so no such proposition as $\sim p$. What then is to be made of a proposition like:

23. Socrates does not exist.

Given that Socrates exists in the actual world, this tenseless proposition is false. But it is possible that Socrates does not exist in the actual world; accordingly, (23) would seem to be possible. But if (23), though false, is nevertheless possible, what can this mean except that (23) is possibly true? But in that case, (23) would be a proposition

in a world from which Socrates is absent and the Law of Excluded Middle would be valid for it. Prior seeks to elude these consequences, however, by reinterpreting the possibility of propositions like (23) in terms, not of possible truth, but of possible *non-falsehood.* That is to say, in worlds from which some individual is absent, propositions about that individual which are false in the actual world would fail to be false in those other worlds because there would be no propositions about that individual. Thus, propositions like (23) are possible, but not possibly true; rather they are possibly non-false. Presumably Prior would apply a similar analysis to future-tense propositions about individuals who exist or have existed. Thus, the proposition

24. Julius Caesar will cross the Rubicon

is false at the present instant, given that Caesar crossed the Rubicon long ago; but it is possibly non-false in that at some instant prior to Caesar's birth (24) would not have been false because there would be no such proposition at that time as (24). Thus, while (24) is possibly non-false prior to Caesar's birth, it is not then possibly true.

Prior's ingenious reinterpretation of the possibility of singular negative existential propositions has, however, been the subject of trenchant criticism on the part of Alvin Plantinga.[57] He lodges three objections against interpreting the possibility of propositions merely in terms of possible non-falsehood. (1) Such a construal of propositions' possibility is too lax. For propositions like

25. Socrates is self-diverse

and

26. Socrates is wise and Socrates is not wise

are possibly non-false, that is, in worlds from which Socrates is absent there would be no such propositions and, hence, they would not be false. But on no sensible conception of possibility ought (25) and (26) to be regarded as possible. (2) Possible non-falsehood fails to be closed under logical implication. For (25) and (26) imply respectively

27. There is at least one thing which is self-diverse

and

28. There is at least one thing that is both wise and not wise.

But (27) and (28) are not even possibly non-false—they are false in every possible world. Hence, Prior's interpretation is logically impaired. (3) Decisively, Prior's interpretation is self-refuting. Letting $E$ stand for entities like singular propositions directly about Socrates, possible worlds containing him, and his essences, Prior wants to maintain that the proposition

29. *E exists and Socrates does not*

is impossible. His view is that if Socrates does not exist then neither
do the entities *E*. But Plantinga points out that (29) would not be
false because there would be no such proposition. Hence, on Prior's
analysis, (29) turns out to be possible after all. The moral to be drawn
from this, concludes Plantinga, is that for propositions possibility is
possible truth. Hence, the possibility of a proposition like (29) means
that such a proposition is possibly true, in which case one would have
a proposition, having a truth value, about an unexemplified individual
essence.

Although Plantinga's concern is only with the individual essences
or haecceities which exist though unexemplified, his objections apply
with equal force when the haecceity is not yet but will be exemplified.
Indeed, in this case, the actual world does contain the individuals of
which the haecceity is the essence, so that Prior's difficulty with unex-
emplified essences would seem to be somewhat reduced. Prior's case
for denying Bivalence of propositions about future individuals is thus
untenable. One way therefore of understanding the truth conditions
of future-tense propositions referring to not yet existent individuals
would be in terms of the haecceities which will be exemplified by these
individuals.

Dispensing with talk of possible worlds altogether, however, one
may appeal to Prior's own device of the branching future to specify
in advance certain individuals. By providing definite descriptions
in terms of genealogy, time, place, and so forth, one may pick out
various possible individuals on various branches of the future about
which propositions may be asserted.[58] Of course, one will not know
whether such propositions are true or false, since one does not know
which branch represents the actual future, but there seems no ground
for denying that as yet non-existent individuals may be so identified.
Indeed, the notion of a branching future presupposes that they can, so
that Prior's denial of logical possibilities prior to individual existence
contradicts his view of time. On the other hand, on a B-theory of time
individuals are identifiable, or attribute specific, as Grunbaum puts it,
since they actually exist. It seems therefore that a denial of the truth
of future contingent propositions on the basis of the unidentifiability
of future individuals is unwarranted.

In any case, however, Prior's view does not solve the problem of
future contingencies, as Gale points out, since it says nothing con-
cerning propositions about the future contingent acts of presently
existing individuals.[59] Since these individuals are existent and identi-
fiable, one cannot regard future contingent propositions about them

as never true. On Prior's view, therefore, a sort of "creeping fatal-ism" follows, as new individuals come into existence and propositions about them become true.

Prior has therefore not justified his contention that (15) and (16) are always false. Furthermore, however, such a view entails what Prior himself admits to be perverse consequences. For it entails that a future contingent proposition which describes a state of affairs that becomes actual is nevertheless *false*. Thus, if one asserts, "A sea battle will take place tomorrow" and such a battle occurs, one must say that one's prediction was nevertheless false, which seems absurd. Moreover, Prior's view also entails that the same future-tense propo-sition may switch from being false to being true or *vice versa* before the present-tense version becomes true or false, according to whether the corresponding state of affairs is necessitated or not. With noth-ing to commend it, such counter-intuitive consequences would seem to preclude Prior's view as a viable solution to the problem of future contingents.

*Timelessness of Truth*

Tensed vs. Tenseless Truth-Bearers

One last escape for the would-be fatalist deserves discussion, that future-tense sentences about contingent events are not the sort of things with which logic is or ought to be concerned.[60] That is to say, the truth-bearers are propositions equipped with tenseless verbs and definite temporal indexicals, and such propositions are timelessly true or false. Since propositions about future contingencies are not true temporally prior to the occurrence of the events in question, such events cannot be said to be fated by the antecedent truth of future contingent propositions. Thus, for example, R. D. Bradley disputes that it makes sense to talk of statements' being true or false "now" or "already." The truth values of propositions do not admit of temporal distinctions. To be true now adds nothing to simply being true. Bradley grants that in ordinary usage grammatical statements have different truth values at different times; for example, "I am 26," "We are not far from the sea," "It rained yesterday." But this is not the case with propositions:

> The relevant difference between them is that, on the one hand, a 'state-ment' (in the grammarian's sense of the word) does not always specify, or specifies only incompletely, the precise state of affairs to which it refers; i.e., it contains words and phrases (*e.g.* 'yesterday,' 'we,' and 'I' in the above examples) whose reference is vague, ambiguous and otherwise in-

determinate, so that it admits of being used in different spatial and temporal contexts and by different speakers with consequently varying truth values, whereas, on the other hand, a proposition or statement in logical form has had these deficiencies remedied by the replacement of vague expressions by precise ones, and further by the use of spatial and temporal indicators specifying the context of utterance, so that its reference is determinate and its truth value accordingly fixed and unvarying.[61]

Kneale and Kneale make the application of this view to fatalism, commenting that Aristotle's fatalistic argument rests on a "confusion concerning the nature of truth and falsity."[62] It may be natural to think that a sentence is true at some time and false at another, but a little reflection shows that this is unsatisfactory. Two persons may utter the same sentence simultaneously and one be speaking truly and the other falsely. Thus, it is not the sentence which is true or false, but what is expressed by it, that is, the proposition. The predicates "true" and "false" apply fundamentally to propositions, and it is not necessary that any particular sentence should have been spoken or written previously. Aristotle's argument is faulty because he thinks the predicates "true" and "false" are applicable to a sentence at a certain time. He is puzzled by the fact that we can say, "It is *now* true that there will be a sea battle tomorrow." But according to Kneale and Kneale, the "now" is superfluous and misleading:

> We mislead ourselves . . . when we speak, as Aristotle does, of its being true *now* that there will be a naval battle tomorrow, for we thereby induce ourselves to suppose that *this* will not be true tomorrow evening, when the battle is over, but something else will, i.e., 'There has been a naval battle today.' Two different *sentences* are plainly involved here, but they both express the same proposition . . . .[63]

Tenses in a language serve to indicate the temporal relation of our spoken or written sentence (the token sentence) to the events of which we speak or write. A past-tense verb indicates the event occurred prior to the utterance of the sentence, present-tense that it is contemporaneous with the utterance, and future-tense that it will be subsequent to the utterance. The addition of "It is true that" or "It was true that" to some sentence does not add any more information or refer to the time of utterance any more than does the sentence itself. Hence, no argument for fatalism can be drawn from such expressions.

This view of the truth status of tensed sentences has, however, come under broad attack, it usually being charged that the proposed translation of such sentences either fails to capture or distorts the meaning of the original sentences. Thus, it is charged that tenseless propositions equipped with definite temporal indexicals cannot inform us, as did the original tensed sentence, whether the event in question lies

in the past, present, or future.[64] Moreover, the meaning of certain tensed statements certainly appears to elude translation into a tenseless idiom. For example, "Today is March 15, 1977" does not mean "March 15, 1977 is March 15, 1977."[65] Similarly, Chapman points out that persons in a tenseless society whose watches had all broken down could not ask what time it is *now* so as to set their watches, for this would amount to introducing a concept of the present into the language.[66] To say, for example, "It is now three o'clock" could only mean "It is three o'clock at three o'clock," which fails to tell them what time it is now. One might attempt to capture the sense of "now" by means of the device "contemporaneous with this utterance." This, however, seems inadequate. For, as Prior charges, there seems to be no way of capturing by means of this device tenses like the future perfect.[67] He observes that the statement "Eventually all speech will have come to an end" must be translated as "The end of all utterances is earlier than some utterance later than this one" –which is self-contradictory. Moreover, it would be of no avail to attempt a combinatorial approach, for as Talbott points out, "this utterance" is itself a tense expression, referring to the sentence now being uttered.[68] It would seem, therefore, that the truth-bearers cannot exclusively be tenseless propositions, but must also include tensed truth-bearers as well, which may be at some times true and at others false.

Perhaps the most effective response to such criticisms would be to distinguish with David Lewis between knowledge *de se* and *de dicto*.[69] *De dicto* knowledge would be comprised of knowledge of appropriately indexed, tenseless propositions; *de se* knowledge would involve the self-ascription of properties relative to spatio-temporal location, identity, and so forth. Knowledge that "It is now three o'clock" involves both propositional and non-propositional content. When a moment later one asserts "It was then three o'clock," the propositional content of his knowledge has not changed, but only his *de se* knowledge relative to his place in time. Or alternatively, one might hold with Kvanvig that belief involves a triadic relation between an intentional attitude, a tenseless proposition which is personally, spatially, and temporally neutral, and a particular manner of accessing the proposition.[70] If a person directly grasps the proposition, then that proposition is expressible by that person in a sentence whose meaning may include reference to self, the "here," and the "now." If a person grasps the proposition indirectly, then it is not for him so expressible. Kvanvig thus replaces Lewis's self-ascription of properties with the notion of accessing a proposition directly or indirectly.

According to Kvanvig, though the sentences "It is now raining" and "It was then raining" have different meanings, we should not infer that different propositions are the objects of belief when we assert one sentence today and the other tomorrow; rather the same propositional object is being accessed, directly or indirectly, through different sentences with different meanings.[71] By means of these proposals the defender of the timelessness of truth could preserve tenseless propositions as the truth-bearers.

## Omnitemporal vs. Atemporal Truth

Be that as it may, however, the more important question that needs to be asked at this juncture is, even if the truth-bearers are tenseless propositions appropriately indexed, whether this understanding of propositional truth really strikes against fatalism, as certain of its proponents allege. It seems not. For most advocates of this position seem to confuse the notions of timeless truth and omnitemporal truth. A tenseless proposition may be appropriately thought to be true, not timelessly, but at all times. Thus, Bradley states that propositions are *always* true or *always* false; a statement about the future is true *now* and *always*.[72] William Kneale associates timelessness of truth properly only with mathematical, metaphysical, and necessary scientific truths.[73] Martha Kneale goes even further in compromising the timelessness of truth: ". . . all that is meant by calling mathematical truths 'timeless' is that there is no point in asking when two and two are four in the way that there is point in asking when the daffodils are in bloom. But this does not mean that it is not the case that two and two are four today; that they were four yesterday and that they will be four to-morrow. These statements are not meaningless or untrue, but simply so obvious as to be pointless."[74] Thus, she equates timelessness of truth with sempiternality (omnitemporality) of truth, declaring that a timeless or sempiternal truth is one which needs neither a system of tenses nor a system of dating for its expression, but is simply true whenever, wherever, and by whomever spoken. Similarly, Talbott maintains that ". . . tenseless propositions are timelessly true or false and therefore . . . statements made with future tense sentences are either true or false *at the time they are made*."[75] It seems, therefore, that the proponents of the "timelessness" of truth really mean that propositions about future events are omnitemporally true and want chiefly to insist that such propositions do not become true: the tensed sentences expressing such tenseless propo-

sitions may indeed be truly asserted only prior to the corresponding events, but the propositions are *always* true or false. But if this is the case, then the doctrine of the "timeless" truth of propositions says nothing against fatalism. For if a proposition is always true, it is *now* true. But in that case, propositions about future contingents are antecedently true, and therefore fatalism follows, if the fatalist's reasoning is correct.[76]

Some thinkers, such as Von Wright or Albritton, might insist that propositions are, indeed, timelessly true, not omnitemporally true.[77] They would regard it as bizarre to hold that "Diamonds are made of carbon" is true on, say, Christmas Eve of 1912. Such oddity, however, hardly constitutes sufficient justification for regarding propositions as atemporally true or false. In any case, this view would still seem insufficient to stave off fatalism, since it might still be truly asserted at $t_1$ that some proposition about future contingents is timelessly true, or that it is the case that at $t_1$ such a proposition is timelessly true, which is all the fatalist needs. Hence, even the strictest appeal to the timelessness of the truth of tenseless propositions does not seem to provide an effective solution to the problem of logical fatalism.

These same considerations also serve to reveal the flaw in the solution to theological fatalism proposed by Aquinas which consists in the timelessness of God's knowledge.[78] For as Helm correctly argues,[79] even if God's knowledge is timeless, it is still the case that for some future contingent $e$, the proposition

30. God knows timelessly that $e$ occurs at $t_n$

is true at times prior to $t_n$, or at least may be truly asserted prior to $t_n$. But (30) entails that $e$ occurs at $t_n$, so that prior to $t_n$ it is true that $e$ will occur at $t_n$ or at least it may be truly asserted that $e$ occurs at $t_n$. Thus, the doctrine of God's timelessness cannot serve as an effective escape from fatalism.

Hence, it seems that the so-called timelessness of truth provides no escape from logical or theological fatalism. Truth-bearers may not be exclusively tenseless propositions but may include tensed propositions or sentences as well. In any event, even tenseless propositions appear to be omnitemporally, not atemporally, true, in which case the problem of fatalism remains unrelieved. Even on the strictest view of the timelessness of truth or of God's knowledge, it may still be truly asserted prior to some event that that event will occur, such that fatalism nonetheless follows, if the fatalistic reasoning is cogent.

## *Conclusion*

The foregoing considerations suggest that the usual avenues of escape—denial of Bivalence or Excluded Middle, re-analysis of the logical form of future contingent propositions, assertion of the timeless truth of propositions concerning future contingents—, which are often proposed with insufficient reflection on the consequences of such moves, are not tenable responses to fatalism. But the common pre-possession of all these proffered solutions seems to be that if future contingent singular propositions are true or false prior to the occurrence of their corresponding events, then fatalism does follow. It is precisely this assumption, however, that needs to be seriously called into question. Let us therefore turn to an analysis of the fatalistic argument itself.

## "WITHIN ONE'S POWER"

It has been observed by one theological fatalist that the crucial step in the argument for theological fatalism is the move from "God knows that I will do $x$" to "I cannot fail to do $x$."[1] Similarly in the case for logical fatalism, the key move is from "It is true that I will do $x$" to "I cannot fail to do $x$." This focuses our attention on the fatalist's notion of "can" or "within one's power." What does it mean to say that, even granted causal indeterminism, it is not within one's power to refrain from some action if it is antecedently true that one will perform that action?

It will be remembered that according to Taylor's analysis "I can" means that my action is causally contingent and is "up to me" or "within my power," notions which are unanalyzable but well-understood with regard to one's lack of power over the past. We saw that with regard to this lack of power over the past, Taylor places great emphasis on the notion of temporal necessity.

### Taylor on "Within One's Power"

Taylor provides additional illumination concerning the relevant sense of power in three articles written during the sixties. In the first of these, "Time, Truth, and Ability" (1964-65), Taylor, writing under the pseudonym of Diodorus Cronus, assumes that the proposition

    1. Stilpo walks through the Diomean Gate at $t_2$

is timelessly true.[2] Hence, at $t_3$, Stilpo did not have the ability to falsify (1), for it was too late. But he could not falsify (1) at $t_1$ either, for it was too early, since (1) is true at $t_2$. And at $t_2$ he could not do otherwise, for this would be logically impossible inasmuch it is true at $t_2$ that Stilpo is passing through. At $t_2$ he is able only to render (1) true in a trivial sense; but how can he render it true, Taylor asks, when it already is true? Taylor's analysis suggests that it is not within one's power to render false any timelessly true proposition, a position which is clearly fatalistic.[3]

A second provocative piece was co-authored by Taylor and Keith Lehrer, "Time, Truth, and Modalities" (1965).[4] They present the following paradox concerning Smith's efforts to reach his destination via the quickest available transport:

    2. If Smith does not leave at 3:30, then he cannot arrive at 4:00.

    3. If Smith does leave at 3:30, then he will arrive at 4:00.

    4. Smith can leave at 3:30.

    5. Smith does not leave at 3:30.

    6. Smith can arrive at 4:00. (3, 4)

    7. Smith cannot arrive at 4:00 (2, 5)

They then refute several objections before providing their own solution. First, (2) should read "will not arrive," not "cannot arrive." Though it is true that Smith will not arrive, it is also true that he cannot arrive, since the plane leaving at 3:30 is the quickest possible transport. It might be objected that "will not" is preferable, with the whole of (2) having the operator of modal necessity. But the problem conditions are such that his leaving at 3:30 is a necessary condition of his being able to arrive at 4:00, so that "cannot arrive" is unobjectionable. Second, perhaps (3) is false: it is possible for Smith to leave at 3:30 and not arrive by 4:00. But again, the problem conditions guarantee that he will arrive at 4:00 if he leaves at 3:30, since the plane is assumed to arrive at 4:00. It might be further objected that (3), (4) do not entail (6), since (2), (5) could also be true. But this inference is validated by modal logic. Third, we can substitute "is able" for "can":

    2´. If Smith does not leave at 3:30, then he will not be able to arrive at 4:00.

    4´. Smith is now able to leave at 3:30.

    6´. Smith is now able to arrive at 4:00.

    7´. Smith will not be able to arrive at 4:00.

But, they retort, what if "now" is 3:30? Then we should have:

    2´´. If Smith does not leave at 3:30, then he is not now able to arrive at 4:00.

    3. If Smith does leave at 3:30, then he will arrive at 4:00.

    4´´. Smith is now able to leave at 3:30.

    5. Smith does not leave at 3:30.

    6´´. Smith is now able to arrive at 4:00.

    7´´. Smith is not now able to arrive at 4:00.

This third objection makes clear, comment the authors, that "Smith can arrive at 4:00" is true prior to 3:30, but false thereafter. Hence, one must distinguish the time of a possible event from the time of the possibility of the event. As their solution, they propose a version of

the second objection. "Can" is a modal term for which the inference from (3), (4) to (6) is not valid. "Can" is equivalent to saying that nothing has by time $t_n$ prevented $S$ from doing $A$. So (4´´) should be amended to read:

> 4´´´. Nothing has happened by 3:30 sufficient to prevent Smith from leaving at 3:30.

Now (3) and (4´´´) are plainly true, since there is nothing to prevent Smith's leaving at 3:30, though in fact he does not. But it is false that

> 6´´´. Nothing has happened by 3:30 sufficient to prevent Smith from arriving at 4:00.

For his not leaving is sufficient to prevent his arriving at 4:00. Thus, the inference is invalid. Again Lehrer and Taylor's paradox has close affinities to fatalism and has been branded as such by Tomberlin.[5] For their solution renders not only (6´´´) false but (4´´´) as well. Given (5), Smith's not leaving at 3:30 is certainly sufficient to prevent his leaving at 3:30 as well as his not arriving at 4:00. And the authors admit that if his not leaving prevents him from leaving at 3:30, then no one can ever do anything he does not do.[6] Thus, their analysis of "can" contributes directly to fatalism.

Finally, we may take note of an article by Taylor, "Prevention, Postvention, and the Will," printed in a volume edited by Lehrer entitled *Freedom and Determinism* (1966). According to Taylor, to prevent something is to do something that was both sufficient and necessary for, though logically independent of, the subsequent non-occurrence of that event. Analogously, to postvent something is to do something that was both necessary and sufficient for, though logically independent of, the antecedent non-occurrence of that event. Both prevention and postvention warrant counterfactual statements "Had not . . . , it would . . . ." Since we speak in this way all the time, queries Taylor, why is it that we find no use for postvention? There are, he believes, four wrong answers which might be given. First, we are unable to postvent things. But we do it all the time, retorts Taylor. Second, nothing in history has ever been postvented. This is true, but by the same token nothing in history has ever been prevented either. "To say of any event that it is a past event logically entails that it was not and never will be postvented. But similarly, to say of an event that it is a future event logically entails that it was not and never will be prevented . . . . All these seemingly grave observations are really utterly trivial, expressing only what is analytically true."[7] Third, we can cause things to occur in the future, not in the past.

This is true enough, but only because we have decided that is how the word "cause" is to be used. There is no reason why "cause" should not be applied to postvention. Fourth, there is a distinction between actions and mere events. But actions are the means to some end, and the end need not succeed the means in time. These could be simultaneous or even reversed, as when I move my arm in order to produce a prior nerve impulse. Taylor's discussion harks back to his earlier piece with Chisholm on retrocausation. His comments here concerning the unalterability of the past and future seem to provide the clue to resolving his fatalism.

### Necessitas consequentiae *and Personal Power*

The above seems to suggest that Taylor, and with him Cahn, has a fundamental misunderstanding of the notion of "can" or "within one's power." Taylor and Cahn appear to confuse *necessitas consequentis* and *necessitas consequentiae*, that is, the necessity of the consequent of a conditional and the necessity of logical implication, and then interpret the modal operators in terms of personal power. Take, for example, a typical fatalistic assertion

> 8. If a sea battle will occur, it is not within one's power to bring it about that it does not occur.

Here, a *necessitas consequentis* is asserted and cast in terms of personal power. But (8) is multiply flawed; what is true is

> 8*. Necessarily, if a sea battle will occur, one will not bring it about that it does not occur.

Taylor and Cahn, however, like Lukasiewicz, typically assume some proposition $p$ and then pronounce that it is not within one's power to render $\sim p$ (or a proposition entailing $\sim p$) true. Lukasiewicz reasoned that if it is true that I shall be in Warsaw at a given time, it cannot be the case that I shall not be there then; but if it is impossible that I shall not be there then, it is necessary that I shall be there then. But as Bayliss points outs,

> Such reasoning, however, is . . . invalid. For what is impossible is not that 'I shall not be there then,' but that 'I both shall and shall not be there then.' The conjunction is impossible, but neither conjunct is. On the assumption that it is factually (*i.e.*, not necessarily) true that 'I shall be there then,' it follows with necessity that it is factually false that 'I shall not be there then'. . . . In other words, because it is impossible that 'P is true and P is false,' it necessarily follows from the assumption that 'P is true' that 'P is not false,' but it does not follow that P's falsity is impossible or P's truth is necessary.[8]

Not only do Taylor and Cahn confuse *necessitas consequentiae* with *necessitas consequentis*, but they appear to have blurred the distinction, often drawn in medieval discussions of freedom and ability, between the composite and divided sense of a proposition. In the composite sense of a proposition, the mode was understood to govern the entire proposition (*de dicto*), whereas in the divided sense the mode concerned the subject or predicate alone (*de re*). Correlated with *necessitas consequentiae* and *necessitas consequentis* in conditional propositions are respectively the *sensus compositus* and the *sensus divisus* in categorical propositions. For example, the proposition

9. This white thing can be non-white

when taken *in sensu composito* means

9.\* This thing which is white can be non-white

or, in other words, that it is possible for something to be both white and non-white. So understood, the proposition is necessarily false. But when taken *in sensu diviso*, it means

9.\*\* This thing, which is white, can be non-white.

So understood, it is true. Now with regard to the issue at hand, consider

10. This future contingent can not happen.

*In sensu composito*, it means

10.\* This event which is future can not happen

or, in other words, that it is possible that a future event will not occur. So understood, it expresses a self-contradiction. But in *sensu diviso*, it means

10.\*\* This event, which is future, can not happen.

Since the event is contingent, (10) is true in the divided sense.

Now Taylor's argument only succeeds in showing that certain propositions are necessarily false in the composite sense, an impossibility which he then construes as a limitation on one's power. That this conception of "within one's power" underlies Taylor's fatalistic reasoning is evident in various passages. This is already evident in Taylor's early musings on "I Can," when he makes the incredible assertion that if I resolve irrevocably to move or not-move my finger depending on the spin of a roulette wheel, then it is not true that I can move my finger or not-move my finger until the wheel stops.[9] The problem with this analysis lies in the fact that one has already decided *irrevocably* not to move or not-move his finger until the wheel stops.[10] Given this irrevocable decision, one's inability to do otherwise is nothing more than the logical impossibility of both deciding to wait on the wheel's result and deciding not to wait on the wheel's result. For the irrevocable decision entails:

11. One will wait on the wheel's result,

and moving or not-moving one's finger prior to the wheel's halt entails:

12. One will not wait on the wheel's result.

Thus, the proposition

13. A man who has irrevocably decided not to move his finger until the wheel stops can move his finger before it stops

is false only in the composite sense, but true in the divided sense. Hence, my supposed lack of power to move or not-move my finger while the wheel is spinning is nothing more than my inability to make a logical contradiction true.

This same understanding is also evident in his pseudonymous article, in which he charges that Stilpo lacks the ability to falsify $p$ if $p$ is true. This is only to assert that the proposition

14. No one can bring it about that a proposition which is true is false

is true in *sensu composito*. For clearly, Stilpo's "inability" concerns only the impossibility of his bringing about two logically incompatible states of affairs. Given that he will walk through the gate, Taylor contends that Stilpo cannot at any time bring it about that $\sim p$ is true. But his supposed powerlessness rests on the assumption that $p$, so that Stilpo's inability is merely his impotence to make $p \cdot \sim p$ true.

Similarly, this same notion of "can" plays a role in the Taylor-Lehrer paradox. The initial version of the paradox is ambiguous, since the truth of (4), (6), and (7) is time relative and (5) appears to be tenseless. This is corrected somewhat in (2′), (4′), (6′), and (7′), not by the substitution of "is able" for "can", but by the clarification of the relevant times. Proposition (5) should be understood as:

5*. It is 3:30 and Smith is not leaving.

The sense of "can" in (4′′) and (6′′) is clarified in (4′′′) and (6′′′). The issue here does not concern the truth of counterfactual statements, but rather the assumption that something is the case and the consequent impossibility of certain incompatible states of affairs also obtaining. Thus, (4′′′) could be rendered:

4*. It is 3:30 and nothing has happened such that "Smith *leaves* at 3:30" is false,

and (6′′′) could be rendered:

6*. It is 3:30 and nothing has happened such that "Smith *arrives* at 4:00" is false.

Now we have seen that (5*) is incompatible with both (4*) and (6*). The co-authors think this leads to fatalism. Why?—because on the

assumption of (5*), Smith does not have the ability to depart; therefore, no one can do anything other than what he does. But this means only that given (5*), it is true that

> 15. It is 3:30, and something has happened such that "Smith *leaves* at 3:30" is false.

Hence, Smith's inability is once again merely the incapacity to make "Smith leaves at 3:30" true when it is the case that Smith does not leave at 3:30, that is, when "Smith *does not leave* at 3:30" is true. Thus, all that has been shown is that
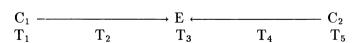
> 16. Smith who is not leaving at 3:30 can leave at 3:30

is false in the composite sense. Therefore, on Taylor and Lehrer's account, it has only been proved that it is not "within one's power" to bring it about that if something is the case, an incompatible state of affairs is also the case.

Now when we come to Taylor's fatalistic argument proper, we discover upon analysis the same notion of "within one's power." At first blush, it would seem that in

> Presupp. 5. No agent can perform an act if a necessary condition for the performance of that act is lacking,

Taylor is speaking of causal conditions: if a necessary causal condition is absent, one is not able to perform some act.[11] This impression is reinforced when we recall that in his earlier piece on backward causation, his fatalistic argument appears embryonically in his attempt to show that future events necessitate present events. Nevertheless, even in that article it soon becomes clear that Taylor's notion of power has nothing to do with causal conditions.

$$C_1 \longrightarrow E \longleftarrow C_2$$
$$T_1 \qquad T_2 \qquad T_3 \qquad T_4 \qquad T_5$$

According to Taylor, at $T_1$, $T_3$ will be as yet future and E will or will not happen; therefore we can bring about $C_1$ only if E occurs at $T_3$. But this only amounts to saying that if it is true that E occurs, then we cannot bring about a state of affairs which involves E's not occurring. In other words, the action which is not "within one's power" is the bringing about of logically incompatible states of affairs. Similarly when Taylor says that at $T_5$ either $C_2$ will occur or not occur, and that if it will occur then it is false that we can perform some action $x$ at $T_4$ to prevent $C_2$, it is once again clear that his claim is that we cannot bring about logically incompatible states of affairs. It is not within our power to bring it about that if it is true that "$C_2$ *occurs* at $T_5$," then it is true that "We *do* $x$ at $T_4$" because this entails

that "$C_2$ *does not occur* at $T_5$," which is logically contradictory to the hypothesis. Our lack of ability at $T_4$, then, is simply a matter of one's inability to make a logical contradiction true. Since in his paper on fatalism, Taylor abandons any claim to be speaking of causation, it becomes even more obvious that the notion of one's powerlessness in the absence of a necessary condition is a purely logical, not causal, matter. Accordingly, (Presupp. 5) expresses a fundamental modal confusion. Taylor confuses *necessitas consequentiae* with *necessitas consequentis* by assuming a certain state of affairs to obtain and then pronouncing it not within one's power to bring about another state of affairs logically incompatible with it. This is perhaps not so obvious in "Fatalism" as in "Time, Truth, and Ability' because in the former he does not assert the impossibility of $\sim p$ given $p$, but the impossibility of $q$ given $p$; however, $q$ entails $\sim p$ so that the notion of powerlessness remains the same: the inability to make a logical contradiction true. It is not within my power to bring it about that if it is true that "No sea battle will occur tomorrow," it is true that "I issue a battle order today" because this entails "A sea battle will occur tomorrow." Hence, Taylor's argument shows only that

17. A sea battle which will occur tomorrow can fail to occur

is false in the composite sense. Taylor's fatalism, therefore, is merely one's inability to make logical contradictions true.

Therefore, it seems to me that Aune, Abelson, Saunders, Makepeace, and Sharvy were all on the right track in attacking Taylor's conception of "within one's power." Taylor and Cahn's examples of powerlessness (like not having it within one's power to play the piano when there is no piano in the room or to swim when there is no water) are not analogous to the alleged powerlessness wrought by logical fatalism. For in these examples, although one has the ability to do some action, one lacks the *opportunity* to do so, that is to say, not all the causal conditions requisite for the performance of the act are present. But in the case of fatalism, all such conditions are present, along with one's ability, and yet the action is still said not to be within one's power. In such a case, one's supposed powerlessness consists merely in one's inability to bring it about that something will both happen and not happen. Thus, Sharvy's contention that what the fatalist denies is my ability to do logically incompatible acts is justified, for he (like Aune) seems correct in contending that for the fatalist modal distinctions collapse, so that "I have the power to do $x$ and the power to do $\sim x$" is equivalent to "I do $x$ and I do $\sim x$." Taylor and Cahn's rejoinder that these propositions are co-extensional but not equivalent seems confused, since for the fatalist the former im-

plies the latter and the latter implies the former, so that a relation of bivalent equivalence holds between them. On the fatalist's view, the former is as contradictory as the latter. At root, then, the dreaded fatalism of Taylor and Cahn is simply one's inability to bring about logically incompatible states of affairs, or to make a logical contradiction true.

Of course, the fatalist might at this point argue that one's powerlessness over against the future is indeed a matter of the logical impossibility of bringing it about that $p \cdot \sim p$ is true. But the salient point of the foregoing critics is that one's inability to bring about logically incompatible states of affairs is not properly a matter of ability or power at all.[12] What is relevant to ability or freedom with regard to some state of affairs is the divided sense only. When we assert

> 18. It is within one's power to bring it about that a future sea battle will not take place

only the truth of the proposition in the divided sense is relevant to the assessment of one's power or freedom. But it is altogether trivial to interpret a *necessitas consequentiae* as an abridgement on one's power or freedom. As Saunders, Makepeace, and Abelson discerned, if one says that "If it is true that $p$, then no one can bring it about that $\sim p$," all this means is that necessarily, if it is true that $p$, then $p$. Hence, Cahn's assertion that "If no battle occurs tomorrow, necessarily I do not issue the order today" involves the confusion of *necessitas consequentis* and *consequentiae*. All that is being said is that, necessarily, if no battle occurs tomorrow, then no order is issued today.[13] Thus, to say that if it is true that "No battle will occur tomorrow," then I do not have the power to issue an order today is to misuse the concept of "power." I *can* issue the order today, but necessarily, if no battle will occur, then I do not. If this is all fatalism amounts to, then it is altogether trivial and innocuous.

## Conditions and Consequences

Perhaps a different approach might serve to clarify the shortcomings of the fatalist's analysis. What Taylor fails to reckon with is why it is true that "No battle will occur tomorrow." The answer to that question can only be because I do not issue a battle order today. And whether I issue an order today depends entirely on my free choice, or as Taylor would say, is up to me. *I* determine whether a battle will occur tomorrow; the battle tomorrow does not determine what I do today. The fatalist has been misled by an inadequate analysis of the relation of conditionship, as Roger Wertheimer emphasizes in his

illuminating article "Conditions."[14] According to Wertheimer

19. P is a sufficient condition of Q

may be taken to mean:

19a. '$p \supset q$' is true (material implication)

19b. P does not obtain without Q obtaining (constant conjunction)

19c. P cannot obtain without Q obtaining (necessary compatibility)

Similarly,

20. Q is a necessary condition of P

may be taken to mean:

20a. '$\sim q \supset \sim p$' is true

20b. P does not obtain without Q obtaining

20c. P cannot obtain without Q obtaining

From (19) and (20) it is said to follow that:

21. P is a sufficient condition of Q iff Q is a necessary condition of P

and from (19), (20), and (21) that:

22. P is a necessary and sufficient condition of Q iff Q is a necessary and sufficient condition of P

These commonly accepted theses are in Wertheimer's opinion mistake compounded on mistake. That (19a) $\equiv$ (19) and (20a) $\equiv$ (20) implies (A) - (F) below. That (19b) $\equiv$ (19) and (20b) $\equiv$ (20) implies all these but perhaps (D). That (19c) $\equiv$ (19) and (20c) $\equiv$ (20) implies (A) - (C) and perhaps (F).

A. Proposition (21) is true.

B. Proposition (22) is true.

C. If '$P \equiv Q$' is true, then P is a necessary and sufficient condition of Q and Q is a necessary and sufficient condition of P.

D. If P never obtains (either necessarily or contingently) or if Q always obtains (either necessarily or contingently), then P is a sufficient condition of Q and Q is a necessary condition of P.

E. There is a condition relation between any two or more events or states of affairs that are constantly conjoined but not causally related.

F. If '$p$' and '$q$' are each necessarily true, then the truth of each is a necessary and sufficient condition of the truth of the other;

more broadly, there can be conditions of the truth of a necessary truth.

Wertheimer contends that all this misconstrues the relation of conditionship. If P is a condition of Q, then Q is a consequence of P. Being a condition or a consequence is thus a relational term between two distinct things. P cannot therefore be a condition or consequence of P, and (C) is accordingly false. Moreover, if Q is a consequence of P, then Q must be in some way posterior to or dependent upon P, and if P is a condition of Q, P is prior to and independent of Q. Hence, (D) and (E) are false. (F) is also false because the truth of a necessary proposition does not depend on any conditions. Finally (A) and (B) are also false.[15]

Analyzing then what (19) and (20) mean, he agrees that (19) implies (19a) and (19b), but denies the converse; the same is the case with (20) and (20a-b). Propositions (19) and (20) each imply the truth functional relation between p and q, but also more. Moreover, if (19) or (20) is true, then it cannot be mere accident (constant conjunction) that P never obtains without Q obtaining. On the other hand (19c) and (20c) are ambiguous. This sentence is non-directional and fails to specify which is the condition and which the consequence. But (19c) and (20c) are not equivalent, since (19c) can be used to assert (19) and (20c) to assert (20). Wertheimer believes the ambiguity in this sentence lies between its asserting either a condition relation or an evidential relation. This same ambiguity is mirrored in the sentence "Q obtains because P obtains." Is P here the condition for Q or merely the evidence for Q? These two relations must not be conflated. Now, says Wertheimer, the foregoing considerations show that the decision on the truth of "P is a condition of Q" cannot be made solely on truth functional grounds. Necessary conditions are conditions such that if they do not obtain, their consequences do not obtain; sufficient conditions are conditions such that if they obtain, their consequences obtain.

According to Wertheimer, there are many cases in philosophy where one senses a difference between two logically equivalent statements, but cannot say what that difference is.[16] It is, states Wertheimer, the difference between a condition and its consequence. Interestingly, the example to which he appeals is Taylor's fatalism. Taylor in his (Presupps.1-3) employs three false premises: (19) ≡ (19c), (20) ≡ (20c), and (21). Wertheimer remarks that since fatalism is not only false but also incoherent, he views Taylor's argument as "neat reductio proof" of the falsity of (13) and hence of (19) ≡ (19c) and (20) ≡ (20c). The critical confusion in the argument is that between the

conditional and evidential relation. He perceives the same confusion in Taylor and Chisholm's piece on backward causation, in that they define "sufficient condition" such that any P, the occurrence of which is sufficient evidence of the occurrence of some Q, would be called the cause of Q.

I take Wertheimer's point with regard to Taylor's fatalism to be that while the non-occurrence of a battle tomorrow would be evidence that I had not issued the order today, it is not a condition of my not ordering the battle today, for my order is the condition of the battle's occurrence. That is to say, my issuing the order is prior to and independent of the battle's occurrence, while the battle's taking place is posterior to and depends upon my issuing the order. Similarly, my reading in an accurate newspaper that a battle occurred yesterday is sufficient evidence that the battle occurred, but it cannot be said to be a sufficient condition of the battle. Therefore, (Presupp.5), even if true, does not apply to such cases. Hence, even if it is the case that $\sim q$ is true and that $\Box\,(p \supset q)$, that does not mean that I am powerless to bring about the truth of $p$, for the state of affairs P is the condition of which the state of affairs Q is the consequence and I am free to bring about P or not-P, thus rendering $p$ or $\sim p$ true. Because I freely determine which propositions about my actions are true or false, my power is not in the least restricted by the truth or falsity of those propositions.

This raises another instructive point concerning the condition relation which holds between future contingent singular propositions and the corresponding states of affairs. The schema "$p$" $\equiv p$ (T-schema for truth) does not disclose the direction of conditionship between a state of affairs and a true proposition about said state. The truth of the proposition is a consequence of the state of reality, not vice versa; the truth of the proposition is logically posterior to and dependent upon which state of affairs obtains. Though we may learn what states of affairs will obtain by knowing the truth of future-tense propositions, such propositions do not condition the obtaining of the states of affairs. The propositions are true as a consequence of what states of affairs will be actual, and it is we who actualize contingent states of affairs by our free choices. Hence, the antecedent truth of such propositions does not in some mysterious way constrain our actions, for the truth of such propositions is ultimately the consequence of our actions.[17] Nor does this involve backward causation: the relationship between a state of affairs and a proposition about it is not causal and temporal but semantic and timeless. For which propositions are true or false is simply determined by which possible world

is actual. Associated with any possible world is a set of propositions about that world, and which world obtains supplies the conditions that determine which propositions are true and which false. Therefore, if it is true that "A sea battle will occur tomorrow," this in no sense restricts my freedom, for it is true only because I shall issue an order for battle today, and it is true that "I shall issue an order for battle today" only because I shall—of my own free choice—issue an order for battle today. Given that "I shall issue an order today" is true and that "If I issue an order today, a battle will occur tomorrow" is also true, it necessarily follows that a battle will occur tomorrow. But in no way does this imply that it is not "within my power" to refrain from issuing the order, for it is I who freely determine which states of affairs will obtain and which propositions are accordingly true.

This brings to mind the reasoning of Freddoso, who argues that an agent $S$ has the power to bring it about that a proposition $p$ is or will be true at a moment $t$ only if $S$ has at the same time the power to bring it about that it has always been the case that $p$ would be true at $t$. According to Freddoso, if we accept that the Principle of Bivalence holds for future contingent propositions and if we agree that if F$p$-at-$t$ is true, then $p$ is true at $t$, we must also maintain, if we are to avoid logical fatalism, that we do have a certain power over the past, namely the power to bring it about that future contingent propositions have been true.[18] Since I have argued that the principle of Bivalence does so hold, and that future contingent propositions are true in virtue of what will obtain, and that logical fatalism is unintelligible, Freddoso's thesis may be strengthened: if Freddoso's argument is correct, it definitely is the case that we have it within our power to make certain future-tense propositions antecedently true. Freddoso admits that such power is not, in the end, very exciting and disassociates it from backward causation: ". . . anyone who brings it about that a future-tense proposition has always been true does so by bringing it about that an appropriate present-tense proposition is or will be true. So power over the past is not basic, but is rather parasitic on ordinary causal contribution to what occurs 'presently'."[19] On Freddoso's view the truth of any future-tense proposition depends on the truth value which will be had by the relevant present-tense proposition. This dependence relation, which is asymmetric, "has to do with logical (in a broad sense) rather than causal dependence."[20] Freddoso's view thus accords nicely with the analysis of the truth of future contingent propositions in terms of condition and consequence. I should merely prefer to say that the truth of future-tense propositions depends on

what states of affairs will be presently obtaining rather than on the future truth of present-tense propositions.

But what of Freddoso's argument for his thesis? It rests on several presuppositions:

G. If $p$ is or will be true, then $Fp$ has been true at every past moment.

H. If (i) $S$ has the power to make $p$ true at $t$, and (ii) $q$ is or will be true at $t$, and (iii) no agent has ever had or will have the power to make $q$ false at $t$, then $S$ has the power to make $p \cdot q$ true at $t$.

I. If $S$ has the power to make $p \cdot q$ true at $t$, then either (i) $S$ has the power to make $p$ true at $t$ or (ii) $S$ has the power to make $q$ true at $t$.

J. If (i) $t=now$, and (ii) $t^*>t$, and (iii) $F(p$-at-$t^*)$ was true at some moment before $t$, then $p$ will be true at $t^*$.

K. If (i) $p$ is logically equivalent to $q$, and (ii) $S$ has the power to make $p$ true at $t$, then $S$ has the power to make $q$ true at $t$.

Suppose, then, that $S$ has the power at $t^*$ to make

(23) *David is in Chicago* will be true at $t$

true at $t^*$. It follows from (H) that $S$ also has the power at $t^*$ to make

(24) $t^*=now$, and *David is in Chicago* will be true at $t$

true at $t^*$. But by (G) and (J), (24) is logically equivalent to

(25) $t^*=now$, and F (*David is in Chicago at t*) was true at every moment prior to $t^*$

So by (K), $S$ has the power at $t^*$ to make (25) true at $t^*$. But he does not have the power to make the first conjunct of (25) true at $t^*$. So it follows from (I) that $S$ has the power at $t^*$ to make the second conjunct of (25) true at $t^*$, that is to say, to make it true that $Fp$ was true at every moment prior to $t^*$.

Freddoso thinks it unproblematic to suppose that $S$ has the power at $t^*$ to make (23) true at $t^*$. I, however, have reservations whether any temporal agent has the power at $t_1$ to make it true at $t_1$ that $p$ will be true at $t_2$. Freddoso's own analysis suggests that what is within our power is making $p$ true, not $Fp$. Therefore, I should revise (23)-(25) to read:

(23*) David is in Chicago

(24*) $t^*=now$, and David is in Chicago

(25*) $t^*=now$, and F (David is in Chicago) was true at every moment prior to $t^*$

So stated, the argument may proceed as before on the same assumptions, and the conclusion will be virtually the same.

A more serious reservation, however, arises with regard to (K). In arriving at (K), Freddoso rejects the formulation

(K′) If (i) $p$ entails $q$, and (ii) $S$ has the power to make $p$ true at $t$, then $S$ has the power to make $q$ true at $t$.

For as Hoffman and Rosenkrantz have shown, power is not closed under entailment.[21] For example, while it may be within my power to bring it about that

(26) Some rocket ship is red

is true, and (26) entails

(27) Some rocket ship exists,

it may not be within my power to make (27) true. Freddoso hopes to rectify the deficiency revealed by this important insight by requiring that $p$ and $q$ are logically equivalent. Although he provides no justification for (K), he considers it "impeccable".[22]

It seems to me that (K) may not be so flawless after all. For consider a situation such as that envisioned in Newcomb's Paradox (to be discussed more extensively in chapter XI): a being guesses in advance whether I shall choose one of two boxes $B_1$ or $B_2$. My choice has absolutely no influence on his prediction, nor is his forecast the result of precognition: it is pure guesswork. Let us, however, suppose that the predictor is infallible, or essentially inerrant. If follows that

(28) I choose $B_1$ ≡ The being predicts that I choose $B_1$.

But while it is within my power to choose $B_1$, it is not within my power to bring about the being's prediction, for the problem conditions guarantee that the being's prediction is entirely outside my control. Therefore (K) is false. But now consider another case in which the notion of precognition is admitted. Here the being cannot fail to correctly predict my choices because he has infallible precognition. So in this case, too, (28) is true. Here, however, it appears that it is within my power to bring about the being's prediction as well as my choice, since my choice determines his precognitions. But what about what lies within the being's power? It is within his power to predict that I choose $B_1$, but it is not within his power to bring it about that I choose $B_1$. So once again, (K) is false. No doubt these cases are exotic, but then again power over the past is an exotic subject and the cases have obvious relevance to the question of theological fatalism.

The above cases suggest is that what is missing from (K) is some mention of the relation of conditionship between $p$ and $q$. Only if $p$

is a condition of $q$ in Wertheimer's sense can one be guaranteed that by having it within his power to bring it about that $p$, one also has it within his power to bring it about that $q$. Accordingly, I should revise (K) to

> (K*) If (i) $p$ is logically equivalent to $q$, and (ii) $S$ has the power to make $p$ true at $t$, and (iii) $q$ is a consequence of $p$, then $S$ has the power to make $q$ true at $t$.

Given (K*) and Freddoso's remaining presuppositions, it follows that since the truth $Fp$ is a consequence of the future truth of $p$ or of the future obtaining of the state of affairs described by $p$, it is within our power to bring it about that certain future-tense propositions were antecedently true. The relevance of this for logical fatalism is obvious: the truth value $Fp$ in no way abridges my freedom or power, for it is within my power to make $Fp$ true or false.

### Fatalism about the Past vs. Fatalism about the Future

At this point Taylor and Cahn offer one last defense of their fatalism: if we need not be fatalists about the future, then we need not be fatalists about the past. Their argument is that if we have the power to change or affect the future, then we must have parallel power over the past, which is absurd. Cahn writes,

> If one persists in claiming that in an important sense of 'ability,' he does have the ability to prevent tomorrow's sea-fight even though it is going to occur, it should be noted that in exactly the same sense of ability, he does have the ability to obviate (or perhaps 'postvent') a sea-fight which took place yesterday, since he also knows just how to obviate that sea-fight (e.g. by reading in an accurate newspaper that no sea fight took place yesterday). If then it is maintained that one has the ability (and not merely the know-how) to alter the future, though one does not, in fact, exercise that ability, it should be noted that in exactly the same sense, one would seem to have the ability to alter the past, though (and this certainly does sound strange) one does not in fact exercise that ability. Thus, if it is true that there will be a sea-fight tomorrow, whatever sort of actions anyone can perform to prevent that sea-fight, he can also perform a similar sort of actions to obviate a sea-fight which took place yesterday.[23]

This, then, is the fatalist's final challenge: either embrace fatalism with regard to the future, or accept the absurd consequence that one has the ability to change the past.

In dealing with this challenge, it is important to keep clear the distinction between *changing* past or future events and *causing* past or future events.[24] To change a past or future event would be to bring it about either that an event which actually did occur did not in fact

occur or that an event which actually will occur will not in fact occur. To cause a past or future event would be either to produce an event via an exercise of efficient causality such that the occurrence of the event precedes temporally the exercise of that causal power or to produce an event via an exercise of efficient causality such that the occurrence of the event succeeds temporally the exercise of that causal power. Thus, to cause the past or future does not imply changing the past or future, since one causes what has been or will be.

## Changing the Past vs. Changing the Future

Now with regard to changing the past, neither Taylor nor Cahn furnishes much analysis with regard to why the past cannot be changed, but Taylor sometimes gives the impression that this is due to the actuality of the past, as opposed to the potentiality of the future. Thus, he asserts that nothing in the past is in any way revocable or alterable by what might happen now, but that this is not the case with things which may come in the future. "The lapse of time by itself thus imposes a kind of necessity on things; things once capable of being otherwise, or of not existing at all, are no longer so. Until an event has happened, it is sometimes possible that it might not, but once it has happened, it is no longer possible that it did not . . . ."[25] Such a suggestion seems, however, erroneous. It is not the actuality of the past which makes it unchangeable; rather it is logically impossible to change the past. Since the past is that which has happened, to assert that one can change the past is to claim that it is possible to bring it about that that which has happened has not happened, which is self-contradictory.[26] The inviolability of the past need be sought no farther than in the meaning of "past" itself.

But if this is the case with the past, what of the future? Since it is in potentiality, does that not mean that it is within our power to change the future? Not at all; for the future is that which will be, and the power to change the future would be the ability to make it true that that which will be will not be, which is again a self-contradiction. In the words of A. J. Ayer,

> The past is closed in the sense that what has been has been; if an event has taken place there is no way of bringing it about that it has not taken place, what is done cannot be undone. But it is equally true, and indeed analytic, that what will be will be; if an event will take place there is no way of bringing it about that it will not take place; what will be done cannot be prevented: for if it were prevented it would not be something that will be done.[27]

These considerations lead Kenny to conclude to there is no sense in which we can change the future in which we cannot change the past.[28] But is this not fatalism? Some who misconstrue fatalism might be led to this conclusion. Thus, William L. Rowe defines fatalism as the doctrine that it is not within our power to bring it about that what has occurred or will occur has not occurred or will not occur.[29] Such a doctrine is, however, tautological and trivial. This is, as explained above, merely to say that it is not within our power to make a logical contradiction true. Necessarily, what has been has been, and what will be will be. But fatalism maintains that what has been has necessarily been, and what will be will necessarily be. This, however, does not follow from the immutability of the past and the future. Ayer explains that if one knew the future, then in a sense the foreseen event is bound to occur; but this sense is trivial. "It is simply that there would be a contradiction in saying that one knew what was false. Even if, without knowing anything, one succeeded in making a true statement which implied that a certain event occurred, the event would, in this trivial sense, be bound to occur; for if it did not the statement would not be true . . . . It does not follow, however, that the event is necessitated in any but this purely verbal way."[30] The upshot for the fatalist is that "If his only ground for saying that an event is fated to occur is just that it will occur, or even that someone knows that it will, there is nothing more to his fate than the triviality that what happens at any time happens at that time or that if a statement is true it is true."[31] Oddly enough, Taylor in his article on postvention actually says as much. No event in past history can be postvented and no event in future history can be prevented. "All these seemingly grave observations are really utterly trivial, expressing only what is analytically true."[32]

## Causing the Future vs. Causing the Past

If, therefore, one may readily agree that it is impossible to change past or future events, what of causing such events to occur? Here the situation appears not to be comparably symmetrical. On the one hand, while we cannot change the future, we can and do by our present actions causally determine it. Future events such as the sea battle tomorrow are caused in part by present actions like one's order for battle. This is not to affirm causation at a temporal distance. Taylor works himself into a muddle first by arguing that causes and effects are always simultaneous,[33] but then reversing himself in asserting that if causes could not temporally precede their effects, there could

be no causal chains.[34] The muddle may be resolved, however, by maintaining that while causation is simultaneous, the things which exercise causal influence endure through time and so impinge on each other in new relationships.[35] In any case, it is evident that we do causally determine the course of events subsequent to the present. Moreover, we do so freely. It is this ability to causally and freely determine the future course of events that accounts for our intuition of the future's contingency, which is misexpressed in the notion that we can change the future.[36] Since our actions have a causal effect on the future and determine which causally contingent branch or course of events will be actual, the unalterability of the future does not entail fatalism in any significant sense.[37]

On the other hand, we do not seem to have the ability to causally bring about past events. If there is no backward causation, then this would account for our intuition of the necessity of the past, which is misexpressed in the notion that our inability to change the past is not merely a matter of logical necessity. If backward causation is possible, then not only need we not be fatalists about the future, but, *pace* Taylor and Cahn, we need not be fatalists about the past either. On the other hand, if retrocausation is impossible, then the question for fatalism will be whether our ability to determine the antecedent truth of future-tense propositions (and, hence, God's foreknowledge) entails backward causation. The issue of backward causation is, however, a hotly contested question, and therefore it seems best to devote a separate chapter to it.

## BACKWARD CAUSATION

## PART I: THE ALLEGED LOGICAL IMPOSSIBILITY

## OF RETRO-CAUSATION

### *Dummet's Defense of Backward Causation*

Although foreshadowed in medieval discussions of divine omnipotence with regard to God's power over the past,[1] the possibility of backward causation has now become a widely debated issue both in the philosophy of the physical sciences and in the philosophy of the parapsychological phenomenon of precognition. The contemporary philosophical debate goes back to a seminal article by Michael Dummett and Antony Flew "Can an Effect Precede its Cause?" (1954).[2] Dummett, while ostensibly agreeing that effects cannot precede their causes, nevertheless argues in such a way as to suggest the possibility that such should indeed be the case. He begins by noting that causes and effects are simultaneous, but that a cause may initiate a process which will result in a remote effect. The question is then whether a remote effect might precede its cause. The answer, he states flatly, is no, for a remote cause immediately causes a process which is in turn the immediate cause of an effect. But, he adds, we might say that some later event which is a sufficient condition of an earlier event is the "quasi-cause" of that event if the following conditions were met: (i) the occurrence of the earlier event would have to be inexplicable by reference to simultaneous and precedent events, (ii) there would have to be some reason to think that the earlier event was not the remote cause of the later event, and (iii) we should have to give a causal account of the later event without reference to the earlier event. Even if these conditions were met, adds Dummett, it would still not be satisfactory unless we could give an account of the causal mechanism connecting the two events.

These are stiff conditions; nevertheless Dummett proposes an illustration of backward causation, and, interestingly, at this point familiar fatalistic motifs begin to appear. He invites us to imagine a magician who can affect the weather. This magician wants it to have been nice yesterday at Liverpool and does not know if it was or not.

So he casts his magic spell, and sometime later he learns that it was indeed nice at Liverpool yesterday. Now, according to Dummett, any argument against so affecting the past will also preclude affecting the future.

In a sense, Dummett turns Taylor's argument about and contends that since we need not be fatalists about the future we need not be fatalists about the past either. According to Dummett, the flaw in fatalism vis à vis the future is the step from "The event is a necessary condition of the action" to "If the event has not occurred, then there is a possibility of trying and failing to perform the action." In the future case, if the action is a sufficient condition of some later event and the event will not occur, then the action just *is* not performed. It is possible that someone might try and fail to do the action, but the failure is not explained by the event's not occurring in the future. Dummett's point is, I think, that from the non-occurrence of the future event it follows only that I do not perform some action, not that I cannot perform that action. But, he proceeds to argue, the situation is similar in the past case. If the event precedes the action, then if the event has not occurred, it follows that the action *will* not be performed. It does not follow that someone tries to perform it and fails; it may be just that he does not perform it. If he does try and fail, his failure is explicable without reference to the non-occurrence of the past event. Again Dummett's point seems to be that if the event did not occur in the past, it only follows that I do not cause it, not that I cannot cause it. Dummett grants that neither the past nor the future can be *changed*, but he insists that if one can nonetheless be said to *affect* the future, there is no reason for denying that he can similarly *affect* the past.

In conclusion, Dummett reflects on the epistemic uncertainty that seems necessarily connected with affecting the past. If the magician knows what the weather was like yesterday, then he will not bother with the spell—it would, says Dummett, be fruitless or redundant, fruitless if the weather were bad and redundant if the weather were nice. This raises a new objection: how can the effectiveness of the spell depend on the magician's ignorance? Even if he did not know what the weather was, his spell would be fruitless or redundant. Dummett answers that the fallacy of the argument lies in the assumption that whether the quasi-cause is effective is a fact independent of what one knows. Here he appeals to the notion of precognition. A man with the power of precognition would know some actions to be fruitless; but we may regard these actions as effective. One cannot argue that because the man rightly regards them as ineffective, they there-

fore are ineffective even though we do not realize it. Unfortunately, Dummett does not explain why one cannot so argue.

Dummett reinforced these conclusions ten years later in his "Bringing about the Past" (1964).[3] Here again he reiterates his belief that backward causation does not occur; there is an objective asymmetry in nature and the direction of causation is not merely a matter of the way we speak of causes, but has a genuine basis in the way things are. Although as mere observers we can conceive of a world in which causation operates backwards (imagine the apple jumping from the ground to the tree, and so forth), still it seems absurd to us as agents to bring about some past event by means of a present action. Nevertheless, Dummett despite these disclaimers argues in such a way as to support the notion of backward causation.

Once more it is interesting to observe how theological and fatalistic motifs are key to his discussion. He takes as his point of departure the propriety of praying that something should have happened, for example, that my son should have been among the survivors of a ship that sank. When I pray concerning the future, I am not asking God to make happen what will not happen, but asking that He *will* make something happen. Similarly, in retrospective prayer, I am not asking God to now make something not to have happened that did happen, but asking that at the time of the past event He should then have done $x$. Retrospective prayer does not involve asking God to bring about the logically impossible feat of changing the past anymore than prayer for the future involves asking Him to change the future in the sense in which that is logically impossible. Dummett maintains that since God foreknows prayer and can act at the time of the event in the past, retrospective prayer makes sense. Now, he continues, the standard argument for fatalism is the exact analogue of the objection to retrospective prayer: Either your son has drowned or he has not. If he has drowned, then certainly your prayer will not (cannot) be answered. If he has not drowned, your prayer is superfluous. So in either case, your prayer is pointless: it cannot make any difference to whether he has drowned or not. Dummett notes that the fatalistic argument is parallel to the argument against backward causation, only the tenses are different. Accordingly he issues this challenge: what refutation of the fatalist's argument can be found to which a parallel refutation of the objection to affecting the past could not be constructed?

With regard to fatalism, Dummett grants that it is indisputable that if you are going to be killed, any precautions you take will be ineffective. But it is not true that if you are not going to be killed,

any precautions you take will have been superfluous. His point would seem to be that if it is true that one will be killed, this entails that the precautions are ineffective (otherwise one would not be killed); but if it is true that one will not be killed, this may be due precisely to the precautions one took. At this juncture, however, Dummett's escape from fatalism becomes very tortured. He argues that the two conditionals

    1. If I take precautions, I shall not be killed

    2. If I do not take precautions, I shall be killed

are compatible with

    3. If I do not take precautions, I shall not be killed.

Therefore, one cannot infer from (3) that precautions will not be effective in preventing my death. The reason (2) and (3) are compatible is evidently because from a false proposition any proposition follows. So if "I take precautions" $(= p)$ is true, it follows from $\sim p$ both that "I shall be killed" $(= q)$ and "I shall not be killed." Hence Dummett concludes,

> Thus, briefly, my method of rebutting the fatalist is to allow him to infer from 'You will not be killed' to 'If you do not take precautions, you will not be killed'; but to point out that on my sense of 'if' on which this inference is valid, it is impermissible to pass from 'If you do not take precautions, you will not be killed' to 'Your taking precautions will not be effective in preventing your death.' For this to be permissible, the truth of 'If you do not take precautions, you will not be killed' would have to be incompatible with that of 'If you do not take precautions, you will be killed,' but, on the sense of 'if' on which the first step was justified, these would not be incompatible.[4]

Dummett is arguing that if $p$ is true and $q$ false, then in the sense of "if" used in material implication, from $\sim q$ one may infer $\sim p \supset \sim q$, since any proposition implies a true proposition. But from $\sim p \supset \sim q$ one may not infer $\sim(p \supset \sim q)$, that is, that taking precautions will not be effective in preventing one's death. Since $\sim p \supset \sim q$ and $\sim p \supset q$ are logically consistent, one may not infer $\sim(p \supset \sim q)$; hence, (2) and (3) are logically consistent with (1).

Now Dummett's solution surely seems to have an air of artificiality about it, dependent as it is on material implication. After all, it is of no help to someone contemplating whether he should take precautions or not to be told that if he will not be killed, then it is true both that if he does not take precautions he will not be killed and that if he does not take precautions he will be killed, or similarly that if he will be killed, then it is true both that if he does take precautions he will be killed and that if he does take precautions he will

not be killed. The problem is that Dummett is employing indicative conditionals to express what ought properly to be expressed with subjunctive conditionals.[5] That is to say, the conditionals with which we are properly concerned are:

    1′. If I were to take precautions, I should not be killed.

    2′. If I were not to take precautions, I should be killed.

    3′. If I were not to take precautions, I should not be killed.

But according to the counterfactual logic governing subjunctive conditionals, (1′), (2′), and (3′) are not logically consistent. For (2′) and (3′) are mutually exclusive, since under this logic a false statement does not imply any statement. Dummett's fatalist is arguing that (1′) and (3′) follow from the fact that I shall not be killed, and it is of no avail to assert that (2′) is consistent with (3′), for it is not. Dummett prefers to use indicative conditionals "rather than hold there is a sense of 'if' on which these two are incompatible, but on which the first step is unjustified because it is notoriously difficult to elucidate such a sense of 'if.'"[6] But this rejected route is precisely the course of argument he should have followed, for (2′) and (3′) are incompatible in the counterfactual sense. In this sense, Dummett's fatalist is unjustified in inferring (1′) or (3′) from the fact that I shall not be killed, for it could equally be true that (2′) or that

    4. If I were to take precautions, I should be killed.

What this serves to reveal is that Dummett's fatalist is not a proper fatalist after all, for as Cahn explains, the fatalist does not claim, for example, that from the fact that I shall be killed it follows that no matter what precautions I should take I should still be killed; rather he claims that from the fact that I shall be killed it follows that it is not within my power to take those precautions which would prevent my death were I to take them.[7] Thus, Dummett's justification for his use of indicative conditionals, namely, it is only on this sense of "if" that the fatalist's first step is justified, is seen to be specious, for the true fatalist does not take this step; that is, he does not argue from "You will not be killed" to "If you do not take precautions you will not be killed," but to "It is not within your power to take the precautions which would prevent your being killed." With regard to this argument, Dummett's refutation lacks a point of contact.

In any case, Dummett uses his analysis of fatalism to argue that there is similarly no logical absurdity in bringing about the past. He asks us to imagine a native chief who dances for a brave hunt while the hunters are away; since it takes two days for the hunters to return after the hunt, this means the chief by means of his dancing during

those two days seeks to affect the past so as to bring it about that the hunters have been brave. We might object that if the hunters were brave, then if the chief does not dance during those two days, the hunters were still brave. But the chief, who apparently has an uncanny grasp of material implication, responds that the statements

    5. If I dance, they have been brave

and

    6. If I do not dance, they have not been brave

are logically compatible with

    7. If I do not dance, they have been brave.

Again Dummett's point seems to be that the true proposition "They have been brave" materially implies that if the chief does not dance they have been brave and if the chief does dance they have been brave. His argument is that any sense of "if" which would allow one to assert (7) would also sanction (6) and that therefore from (7) one cannot infer that the chief's dancing is ineffective in bringing about the hunters' bravery. Therefore, one cannot logically disallow that the chief's dancing does indeed bring about the past.

Now it might be objected that it was only the chief's ignorance which allowed him to think his dancing had any effect, but that such ignorance does not make any difference as to whether he could affect the past or not. So we challenge him to dance during the two days of the hunters' return journey when we know that the hunters have not been brave. He accepts the challenge and either (i) he dances and nothing is different, (ii) he is prevented from dancing by some accidental occurrence, or (iii) he dances and it is learned that the reports of the hunters' cowardice were false and that they were after all brave. Hence, in order to maintain the belief that one can affect the past and the belief that it is within one's power to do the action or not as one chooses, concludes Dummett, one must abandon the belief that it is possible to find out what has happened independently of one's intentions. Dummett apparently takes the first belief as incompatible with (i), the second belief as incompatible with (ii), and the third belief as incompatible with (iii). Hence, if one holds the first two beliefs, he must accept alternative (iii) and hence give up the third belief. This situation, however, is in Dummett's opinion, parallel with our situation vis à vis the future: I never believe that (i) an action A is positively correlated with a subsequent event B, (ii) action A is within my power to perform as I choose, and (iii) I can know whether B is going to take place or not independently of my intention. But the difference between the past and the future, says Dummett, is that for the past, unlike for the future, we can find out what has happened

independently of my intentions. If therefore we adhere to the third belief we must abandon (i) or (ii) instead. The case of retroactive prayer is atypical because we only pray for that of which we are ignorant; hence, in Dummett's opinion it "involves no tampering with our ordinary conceptual apparatus."[8] Thus, Dummett concludes on a sceptical note with regard to backward causation, though the effect of his articles was to enhance in the minds of many philosophers the possibility of retro-causation.

### The Logical Objection to Backward Causation

#### Antony Flew

Dummett was countered in his first piece by Antony Flew, who thereafter became a perennial critic of backward causation. According to Flew, it is a "truth of logic" that an effect cannot precede its cause.[9] One might expect a Humean scholar to mean thereby that necessary and sufficient conditions which temporally precede an event are denominated "cause" while those which succeed an event are denominated "effect," so that by definition a cause must precede its effect. This is not, however, Flew's meaning. Rather he explains that causes *bring about* their effects; they are levers to produce effects. Hence, backward causation would commit us to the contradictory thesis that what has been done can be undone; otherwise we should have a notion of cause that scarcely could be counted as a cause because it could operate only when preceded by or contemporaneous with its effect. The point here, which Flew will reiterate in subsequent articles, is that backward causation entails changing the past, which is logically impossible. If one denies this, then one must affirm that once the effect is given the retro-causal event cannot be prevented, which is entirely implausible. Once an event is determinate, any action to influence it will be either fruitless or redundant. With regard to the future, Dummett errs in maintaining that if one knows what is going to happen he would do nothing now to make it happen. For he may know that his activities are instrumental in bringing about what he knows will happen. That being said, however, Flew closes with the admission that if we had "looking glass" precognition, then every effort would indeed be fruitless or redundant. Interestingly, he thereby seems to concede to Dummett that the past and future are parallel except that I can know with respect to the past whether an event has occurred, whereas I cannot know with respect to the future whether an event will occur, a central contention in Dummett's second article.

Michael Scriven

Flew pursued the debate with several other philosophers within the pages of *Analysis*.[10] Undoubtedly one of the most interesting pieces in this debate was Michael Scriven's "Randomness and the Causal Order" (1956-57), in which he develops the theme of precognition.[11] He asks us to imagine a group of psychics who on Monday draw sketches of pictures to be hung on the wall on Tuesday as chosen by some random selector, such as dice, a roulette wheel, a number table, and so forth. Using the random selector, on Tuesday one obtains three numbers, computes their sum, opens the Oxford English Dictionary to that page, picks the first common noun in the left hand column, and draws a picture of that thing to be hung on the wall. One could try to explain the psychics' successful predictions by maintaining that the guesses on Monday determined the outcome of the random selector. But, asks Scriven: (1) How can we explain the unanimity among the guesses made on Monday? (2) How could their guesses affect the random selector? (3) How could affecting the selector produce the item chosen from the dictionary, since one would have to know the code? (4) If a number table is used as a selector, how could the guesses affect the experimenter's neural paths? Now, Scriven continues, suppose further that on Tuesday, the experimenter does not hang up any picture: what then caused the guesses? The answer would be merely in terms of the psychological antecedents of those guesses. Suppose instead that on Tuesday the experimenter hangs up a picture which is deliberately not correlated with the psychics' guesses: it might be argued that if this is possible then no precognition has occurred and if it is not possible then the guesses are causing the result in some way. But Scriven retorts that this supposition violates the description of the experiment and so is not a cogent objection. He proceeds to argue that the issue at stake is not altering the past; rather it is whether the past can be *determined* by what we do now. In Scriven's experiment, the guesses are statistically correct, not infallible. We do not know in advance which guesses are genuine precognitions. Therefore, falsification of a guess does not constitute a disproof of precognition and, hence, of backward causation. (It would be interesting to know what Scriven would say if the precognizer were in fact infallible in his predictions).

In response to Scriven, Flew seems convinced that backward causation would entail altering the past: if a significant proportion of the psychics drew tricycles on Monday and the experimenter pinned up a Jaguar XK 140, this would result in the Monday drawings' contain-

ing the significant proportion of Jaguar XK 140's.[12] To deny this is to
rob causation of effectiveness. All that is left is constant conjunction
and lawlike connection. One can analyze constant conjunction along
Humean lines in terms of material implication; but lawlike connection
goes beyond this, stating that if A had not been, B would not have
been. Flew is prepared to allow this sort of non-causal connection
to be applied in precognition research, but he insists that because
effectiveness is absent one may not speak of an event's retroactively
causing a precognition. At most one could say that if the event were
not to be, then the precognition would not have been. But the fact
that one cannot change the past shows that the later action can-
not be effective in bringing about the past event. To says $e_2$ might
bring about $e_1$, which has already either happened or not happened,
involves a hopeless contradiction. Flew admits that what he calls
the "bilking experiment" can be avoided by insisting on the initial
stipulations, but, he states, the price is "too high."[13] That price, pre-
sumably, is fatalism, for once the precognitive predictions have been
made, the experimenter is no longer free to hang whatever picture he
chooses on the wall.

Dummett's second article also drew a number of replies, of which
two are noteworthy.[14]

## Richard Gale

Richard Gale attempts to find an acceptable counter-example to the
purportedly analytic truth that a cause cannot be later than its
effect.[15] The problem with Dummett's illustration is that there is no
need to appeal to backward causation in order to explain the hunters'
bravery. So Gale imagines a case in which Jones warns Smith from
out of the future: "Smith, this is Jones talking to you from your fu-
ture. There's a time-bomb in your desk drawer!" This case satisfies
five criteria: (1) the use of "past" and "future" is not radically al-
tered. (2) $L$ (Jones's speaking) never occurs without being preceded
by $E$ (Smith's hearing the voice). (3) $L$ is an intentional action and
on any occasion that Jones does $L$ he cannot know that $E$ occurred
independently of his intention to do $L$. (4) $E$ is not a cause of $L$.
(5) E is called paranormal because it has no prior proximate cause.
Now, Gale argues, on the one hand Jones cannot know whether $E$
occurred, since he intends to cause $E$; but on the other hand, Jones
can know that $E$ occurred since $E$ is past and it is logically possible
for Jones to have a memory trace of $E$. So it is both logically possible
and impossible for him to know that $E$ occurred. Suppose, says Gale,

Jones remembers that Smith was killed and decides to warn him: we are thus led to a contradiction between memory and intention. Since the example meets the stipulative conditions for backward causation, yet leads to a contradiction, it follows that it is logically impossible for effects to precede their causes.

## Richard Swinburne

Swinburne argues that it is logically impossible to affect the past. [16] While acknowledging that it is clearly impossible for one to *change* the past, Swinburne asserts that any defender of the possibility of affecting the past must claim that the alleged action produces changes in the evidence about what happened in the past; for example, the observers who reported the hunters' cowardice must admit to lying when the chief dances for the hunters' bravery subsequent to their report. For unless this happens, there would be no grounds for supposing that the action had any effect in the past at all, and hence no meaning could be given to the claim that it had such an effect. But Swinburne maintains that no change in the evidence could possibly substantiate the claim that someone had affected the past; therefore, it is logically impossible to affect the past. In order to establish his point, Swinburne first differentiates two ways in which the evidence may change: either a change of memory claims or a change in the traces of the past. Suppose then that an advocate of backward causation states that an act at $t_2$ made the evidence (memory and traces) about the past different at $t_3$ than it was at $t_1$. Swinburne responds that if the evidence at $t_3$ is better evidence about what really happened, then the past has not been affected by the action at $t_2$. Thus, in Dummett's illustration, the chief's dance does not affect the past— it only affects the observers' state of mind to make them realize that they were mistaken or lying when they reported the hunters were cowardly. Hence, no matter how we interpret what happens when an action at $t_2$ makes a difference to the evidence about events at $t_1$, we can never be justified in claiming that the action affected a past event itself.

### *Assessment of the Logical Objection*

Such were some of the immediate responses to Dummett's analysis of backward causation. The artificiality of the illustrations of these early pieces with their dancing chiefs and magical weathermen ought not to blind us to the fact that the issue of backward causation is an

extremely important one, particularly in the philosophy of science, where the legitimacy of retro-causal explanations for certain empirically observed phenomena is at stake; nor can the philosopher afford to ignore the parapsychological evidence for precognition, which ought to be of special interest to the philosopher of religion, as it stands closest in analogy to divine foreknowledge. Before looking into these adjacent disciplines, however, let us examine the issues raised in the philosophical debate thus far.

## Two Words of Caution

Some words of caution to begin with: in the first place, there seem to be two sorts of backward causation illustrated in the literature which are rarely, if ever, distinguished.[17] On the one hand, there is the sort of extra-ordinary backward causation envisioned by Dummett, Scriven, and others in which one brings about the past immediately by an intentional action. On the other hand, the backward causation described by Taylor and Chisholm involves no extraordinary or immediate action of an agent on the past, but merely a descriptive change, such that what is commonly called the effect may with equal validity be denominated the cause, so that which event in the normal causal series is designated "cause" and which "effect" is wholly arbitrary. Perhaps the essential difference between these two notions is that the former involves an exercise of efficient causality to bring about a past event, whereas the latter construes causality merely in terms of necessary and sufficient conditions, which are time-reversible.[18] A future event's causing a precognition in a psychic's mind would be an example of the former; an alarm clock's ringing being the sufficient condition of its having been wound up is an example of the latter. The difference is not one of intentionality: an electron's pre-acceleration by the later action of some force in classical electrodynamics would be classed as the former type; my passing my bar exams being a sufficient condition of my having studied law is an example of the second type. It seems clear that the first sort of backward causation involves a claim more radical than the second.

In the second place, it is very easy to fall into the error of rash generalization with regard to the possibility of backward causation, as Fitzgerald warns.[19] He points out that the absurdities described by opponents of backward causation show only in special cases that backward causation is impossible, but not in all cases. Accordingly, if one is arguing against backward causation *tout simple* he must be

careful that his objections apply across the board and not to peculiar instances or even a certain type of retrocausal action.

<div align="center">Assessment</div>

*Affecting vs. Changing the Past*

Turning now to an assessment of the arguments themselves, it seems clear that Flew in his fundamental objection to backward causation erroneously assumed that bringing about the past involves changing the past, which is logically impossible; hence, he concluded backward causation is logically impossible. Though he seemed to qualify this in his second piece on the subject, it is evident in his later response to Bob Brier that he still entertained this misconception. Brier had pointed out that Flew was wrong to think that backward causation commits one to saying that the past can be undone—there is a difference between changing the past and affecting the past, and the latter involves no contradiction.[20] Flew retorted that it is "breathtakingly perplexing" what this distinction is between changing the past and affecting the past.[21] This is, he charges, "a new distinction," one not found in the philosophical journals. Flew confesses that he can only understand "affecting the past" to mean "seeing it from a new perspective." He remains "entirely at a loss" to understand why Brier thinks backward causation to be unexceptionable. ". . . it must be wrong to speak of a present cause bringing about a past effect; since this could only be a matter, either of undoing what has already happened, or of making to have happened what has not happened."[22] But the distinction between changing and affecting the past was drawn by Dummett in his original article to which Flew responded and was reiterated by Scriven, so that Flew's surprise and perplexity at this point are themselves perplexing. Once more, to make it clear: the issue at hand is not whether a cause can bring it about that an event that occurred in the past no longer occurred, but whether some event which occurred in the past might have a cause that is subsequent in time to the event's occurrence.

In some places, however, Flew speaks as though he is presenting a dilemma: if one has the power to change the past, one has the power to bring about a contradiction; if one does not have the power to change the past, then one is not justified in speaking of causation at all. But the reasons Flew gives for the dilemma's second horn are far from satisfactory. His assertion that such a cause could only operate when the effect has been given commits the same modal fallacy as fatalism, namely inferring from

8. Necessarily, if the effect is not given, the cause will not occur
to

9. If the effect is not given, the cause will necessarily not occur,
or in other words,

10. If the effect is not given, the cause cannot occur.

All Flew has the right to say is that the cause *does* only operate when
the effect is given, not that it *could* only operate when the effect is
given. Hence, once the effect is given, it follows only that the cause
will not be prevented, not that it cannot be prevented. Flew thinks
that one has thereby denied the notion of "effectiveness," which is es-
sential to the causal relation. By this notion Flew means something
like "manipulatability," the capacity to be used to produce something
else. Causal directionality, on this view, depends on one event's being
capable of being manipulated so as to produce the other in an asym-
metrical fashion. Thus, for any two events $A$ and $B$, the one which is
the cause of the other is that event which is effective in bringing about
the other. Some have objected to this conception of the essence of
causal directionality because, they charge, it is too anthropocentric,
leaving out of account the causal priority that belongs to the natural
world.[23] This objection seems to me unjustified, however, for effec-
tiveness is a dispositional property about what might in principle be
done, and so is not limited to the sphere of human actions.[24] In any
case, neither effectiveness nor causal directionality seem to have any-
thing to do with the issue of backward causation.[25] The directionality
at issue is causal, not temporal, and effectiveness is meant to help de-
termine causal directionality even in two simultaneous events.[26] What
Flew presupposes is that a retro-actively operating cause cannot be
manipulated so as to bring about its effect. But why not? The an-
swer presumably is, because the effect is already given; therefore, the
cause must follow. But again, this commits the old fatalistic fallacy
once more. One can manipulate a backward-operating cause just as
much as a forward-operating cause, and effectiveness is not removed
because the effect has happened any more than because the effect will
happen. From the fact that the effect has been or will be given, it
follows only that the cause is operating, not that it must be oper-
ating such that effectiveness is removed.[27] Thus, it is Flew, not the
proponent of backward causation, who is the fatalist's bedfellow, as
Dummett rightly saw.

But Dummett's own analysis of effectiveness as dependent upon
ignorance is deficient as well. It does not follow from one's knowledge
of the past event that one's attempt to bring about that event via

backward causation is fruitless or redundant, for the event may have occurred precisely because one wills to bring it about. Indeed, if the event can be produced only by an exercise of backward causation, then upon observing the event one knows that he will in fact bring it about. Dummett's comments on precognition and effectiveness seem incoherent; for if the precognizer knows that $p$, it follows that $p$, even if we are unaware of it. Thus, if the precognizer knows certain actions are ineffective in producing some effect, then they are ineffective, though we may happen to regard these actions as effective.

Similarly, it does not at all follow from Dummett's outcomes (i-iii) of the chief's dancing after reports of the hunters' cowardice that one must, in order to retain belief in backward causation and personal freedom, abandon the belief that it is possible to find out what has happened independently of one's intentions. At the most, one would have to abandon the belief that one does find out what has happened. However, it is not necessary to embrace even this belief in order to preserve personal freedom. For outcome (ii), that one is prevented from retroactively causing the effect by accidental causes, does not take sufficient cognizance of the fact that the reason one may not retroactively cause the effect may be due one's own free will, for example, simply changing one's mind or choosing to do something else deemed more important. For example, the chief may suddenly learn, after accepting the challenge, that his first born son has fallen gravely ill and he chooses to dance for his recovery, rather than indulge in our foolish game. In such a case, it is within his power to dance for a brave hunt, but he chooses not to do so. If such situations are included within the scope of outcome (ii), then it does not follow that one *cannot* perform the retrocausal action, but only that one *does* not. Hence, the belief that is incompatible with outcome (ii) is the belief that one does perform the action. Moreover, the belief incompatible with outcome (i), that one performs the action and the effect did not result, is the belief, not that one can affect the past, but that one does affect the past. Thus we have three beliefs negatively associated with outcomes (i-iii): (i´) belief that one's action does affect the past, (ii´) belief that one does perform the action, and (iii´) belief that one does know whether the effect has occurred.

Now since these three beliefs contradict respectively the three possible outcomes, it follows that in order for one of the outcomes to result, the corresponding belief will have to be abandoned. In order to preserve backward causation, we must reject outcome (i) and so accept belief (i´), that is to say, the chief must believe that his dancing does affect the past. But here we must part company with Dummett.

In order to retain belief in personal freedom it is not necessary to re-
ject outcome (ii), for belief (ii´) says nothing for or against freedom of
choice. If we accept outcome (ii), it follows only that we must aban-
don belief (ii´), not that we must abandon belief in personal freedom.
That is to say, if the chief is prevented for any reason from dancing,
he must abandon the belief that he does dance. Similarly, if we accept
outcome (iii), this says nothing against one's ability to know the past,
for it only entails that belief (iii´) is false, that is, the one does know
whether the effect has occurred, not that he *can* know whether the
effect has occurred. That is to say, if the chief learns that the reports
of the hunters' cowardice were false, he must abandon the belief that
he knew that the hunters had been cowardly. Thus, the chief, hold-
ing to belief (i´) and confronted with Dummett's challenge, knows, as
logically shrewd as he is, that he will have to abandon belief (ii´) or
(iii´), though he may not be sure which. Suppose then he knows that
(i´) and (iii´) are true beliefs—does this remove effectiveness from
his dancing? Not at all; it only means that he knows that for some
reason or other he will not dance as he intends. He knows that he is
still free to choose to dance and that were he to dance, the miserable
cowards would have been brave; but he knows as well that for some
reason he will not dance.

With regard to Dummett's application of his reasoning to future
actions, there seems to be no incompatibility between believing that
an event is within my power and knowing that it will take place,
for all this tells me is how I shall act, not how I must act.[28] Flew's
response to Dummett on this score is thus on target, though he curi-
ously reverses himself in admitting that "looking glass" precognition
would make every effort fruitless or redundant, an admission which is
misconceived, since we may know that an event will occur precisely
because we are convinced that we shall bring it about.[29]

In sum, then, it seems that the objection against backward cau-
sation based on the logical impossibility of changing the past rests
on a misconception of the relation involved and further that to deny
that backward causation is causation unless it alters the past be-
cause it otherwise lacks effectiveness is unwarranted. To conclude
that because an effect has occurred one is not free to refrain from
retroactively causing it is just another instance of the modally falla-
cious reasoning that plagues fatalism. For the same reason one cannot
cogently maintain that the effectiveness of a retro-cause somehow de-
pends on one's ignorance of whether the effect has occurred.

*Failure of the standard objection*

What, then, may be said concerning the standard objection to back-
ward causation, namely, that once the effect is given, one might inter-
fere to prevent the backward cause from occurring? It it is said that
one cannot so interfere, then, it is argued, fatalism results. I think
that by now the fallacy in this reasoning has become obvious. From
the fact that the effect is given, it follows only that one will not in-
tervene, not that he cannot intervene. Thus (*contra* Max Black) from
the precognition of the outcome of a penny's toss, it follows only that
the penny will be so tossed, not that the experimenter is not free to
refrain from tossing it. If he were to refrain, then (as Scriven and
Pears point out) it only follows that the prediction would not in that
case have been retroactively caused after all. The initial conditions of
the *Gedankenexperiment* are that the prediction is a genuine, retroac-
tively caused precognition, and from that it necessarily follows that
the cause will be given, but not that it will be given necessarily.[30]
Similarly, if Scriven's psychics precognize what will be displayed on
the morrow, it necessarily follows that the picture will be displayed.
For some reason or other, the experimenter's attempt not to hang up
the picture will go awry—perhaps an uninformed lab assistant or the
janitor will hang it up instead. For the precognition is *caused* by the
display of the picture; therefore it will be displayed. If it is not hung,
it follows that the psychics' unanimity was the result of luck or per-
haps some other parapsychological phenomenon like telepathy. But
in no way does the standard objection prove that backward causation
is impossible. Nor does this exact the high price feared by Flew: the
reasoning behind his bilking experiment actually leads to fatalism,
not away from it, for it implies that if something will be the case it
could not be otherwise.[31]

In any event, the standard objection to backward causation serves
an epistemic function only. For all it can conceivably do is cast doubt
upon whether we are ever certain of having in fact an instance of
backward causation. The fact that we can sometimes prevent the
purported retro-cause after observing its purported effect does noth-
ing to show backward causation is impossible. We could not be cer-
tain that in the percentage of unbilked experiments there were not
cases of genuine retrocausation, nor that there are not in nature as
yet unobserved backward causes. As Chapman states, the standard
objection only precludes retrocausation's being the preferred expla-
nation in some alleged cases.[32] Hence, the objection does nothing to
prove the impossibility of backward causation.

*Failure of Gale and Swinburne's Objections*

Therefore, we must seek elsewhere if we are to find an argument as to why backward causation is impossible. Gale's argument runs afoul of the same considerations that render Dummett's notion of effectiveness untenable, to wit, his condition (3) that the backward cause must be an intentional action and the agent cannot know that the effect has occurred. We have seen that at the most Gale could claim that the agent *does* not know whether the effect has occurred. Moreover, this rules out by stipulation naturally operating backward causes, which is too restrictive.[33] Since the contradiction Gale seeks to elicit—Jones can and cannot know the effect has occurred— depends on modal operators, it follows from the above mistake that no contradiction arises: all that follows is that Jones can know the effect has occurred and Jones does not in fact know the effect has occurred. But as we have also seen, there is no good reason to suppose that in every case of backward causation the agent does not know the effect has occurred. Jones may well know that Smith's life was saved because he heard Jones's warning, and therefore Jones has every intention of warning Smith and knows that he will in fact do so. If he knows that Smith died in the blast, then he knows that something will prevent his warning. But he may try to warn Smith anyway, knowing full well that he will fail, in order that Smith's death can in no way be blamed on Jones's laxity and inaction; instead, he surmises, accidental causes will prevent Jones's warning, thus exonerating him. Besides, does Jones know that he knows Smith died? Perhaps he will discover that the reports of Smith's death were wrong after all; therefore, it is at least worth a try to save him. Hence, even if one knows whether the effect has occurred or not, it will be worth his trouble to try to bring it about if he does not know that he knows the effect has occurred.

Swinburne's objection is no more compelling. For why must we suppose that in every case of backward causation the evidence changes?[34] Swinburne's answer—because only then should we have grounds for supposing it was a case of backward causation at all—is anthropocentric and reveals the objection to be merely epistemic in character. Even granted that we could not know that backward causation had occurred, how is this a proof that it has not in fact occurred?[35] Swinburne's suggestion that such a claim would then have no meaning seems to presuppose a defunct verificationism and need not detain us. Moreover, even in its epistemic function, Swinburne's objection is weak, for it is not clear that a change in the evidence is necessary to provide reasonable grounds for accepting backward causation, since

such a consideration plays no role in precognitive experiments and would not be necessary in a case of time travel. Swinburne proceeds to argue that in any purported case of backward causation, the explanation always to be preferred is that the action has changed the memory claims or traces of the past rather than that the past itself has been caused. But why? Swinburne never justifies this preference, let alone shows that it is logically necessary, especially in view of the radical sorts of alterations that could be forced upon the present by such a position.[36] More importantly, the objection is impotent in the face of cases in which the past effect is unique and could not plausibly have been produced by prior causes. In such cases, the explanation that the cause has only changed the evidence says nothing about how the original event came about. Since such cases are logically possible, Swinburne's explanation is not always to be preferred, unless there are independent grounds for believing backward causation to be impossible. In short, his refutation seems utterly unavailing.

### Logical and Metaphysical Modality

None of the opponents of backward causation would therefore appear to have succeeded in demonstrating that it is logically impossible for an effect to precede chronologically its cause. Such a conclusion, however, hardly comes as much of a surprise and, I must confess, does not appear to me to strike at the heart of the matter. For the really interesting question is not whether backward causation is logically possible, but whether it is really (or ontologically or metaphysically) possible. That is to say, backward causation may be possible in a broadly logical sense, but nevertheless incapable of characterizing reality. Analogously, that something should come into existence uncaused out of nothing is logically possible, but, it might be plausibly maintained, is really impossible. The proposition that something does not come from nothing is thus a synthetic *a priori* statement, that is to say, while its opposite involves no logical contradiction so that the statement is not analytic but genuinely informative, nevertheless it is not dependent for its truth upon experience but is characterized by universality and necessity. In terms of a possible worlds semantics employing the notion of broadly logical possibility, this means that while there are worlds in which things come into existence out of nothing, none of these worlds can be actual. Hence, the statement has an ontological, if not a logical, necessity and is universal in that it is true in all worlds that can be actual. David Lewis's notion of different spheres of accessibility can help us here.[37] He explains that the seman-

tics of possible worlds can be cast in terms of different conceptions
of modality, which may be represented as different spheres varying in
restrictiveness and each containing its possible worlds. Worlds that
satisfy the restriction associated with the sort of modality under con-
sideration are called "accessible" and together constitute a "sphere of
accessibility" over which the modal operators range, necessity acting
like a universal quantifier over possible worlds in a sphere and pos-
sibility like an existential quantifier over worlds. The nature of the
necessity/possibility associated with each sphere varies in restriction
as one moves from one sphere to another. Thus, the modality of the
least restrictive sphere is logical necessity/possibility and its various
worlds are determined by that conception. More restrictive than this
sphere is the sphere of nomological necessity/possibility, in which the
worlds are those where the actual laws of nature hold. More restric-
tive still is the sphere of physical modality, its worlds determined
by the constraints of what is actually physically necessary/possible.
Where one places a sphere of causal modality will depend on one's
views on such subjects as determinism and the possibility of miracles.

Now my suggestion is that we entertain the conception of a sphere
of ontological modality ranging in restriction somewhere between
the nomological and logical spheres. This sphere restricts from its
range of worlds those worlds found in the sphere of broadly logical
modality which cannot be instantiated in reality. This understanding
will involve rejection of the identification made by Loux and others
of broadly logical modality with metaphysical modality.[38] Typically,
broadly logical modality is not defined by those who make this iden-
tification; it is merely said to employ a notion of possibility narrower
than that of strictly logical possibility (which characterizes a propo-
sition just in case it is not the negation of a thesis of first order logic,
for example) but broader than physical possibility (which character-
izes a proposition just in case it does not violate a law of nature) and
examples of broadly logically possible propositions are given. But
why should we make this identification? This question seems to be
generally ignored, but in another context Loux explains that propo-
nents of an actualist ontology of possible worlds like Stalnaker and
Plantinga "construe the possibility of these abstract objects to consist
in some variant of the generic notion of instantiability" and "hold that
the framework of possible worlds is grounded in the fact that these
modal entities have a modal property or characteristic, that of being
possibly instantiated or instantiability."[39] If the possibility of possible
worlds consists in their instantiability, then perhaps this fact might
justify the identification of broadly logical with metaphysical modal-

ity, since there are no possible worlds which are not instantiable. This purported justification would seem to beg the question, however, for the question precisely is, what variant of the generic notion of instantiability is at issue here? The modal property of being possibly instantiated could be construed to mean something like a world's not involving two logically contradictory states of affairs. Such a property would ensure that such a world is broadly logically possible, but would not imply that such a world is metaphysically or ontologically possible, that is to say, actually instantiable. Hence, Loux notwithstanding, I see no warrant for identifying these two types of modality. Thus, propositions true in all worlds throughout the sphere of ontological modality are not logically necessary, even in the broad sense, but are what in other contexts are called synthetic *a priori* truths, that is, truths which are genuinely informative, but which *must* hold for any world that is actual. The proposition *ex nihilo nihil fit* would appear to be a plausible candidate for such a status. So would "No event precedes itself," for no logical impossibility arises from its negation and yet it cannot fail to be true because a purportedly cyclical view of time cannot avoid the succession of one cycle after another.[40] Now the question I wish to raise is, what is the status of the proposition:

11. No effect precedes its cause.

Could this proposition be ontologically necessary, though its contradictory is logically possible? Contemporary discussions of the possibility of backward causation have proceeded almost without exception on the purely logical level and so have neglected this question. But as Gorowitz saw, the issue needs to be raised on a different level of modality and there re-explored.

## PART II: PURPORTED INSTANCES OF RETRO-CAUSATION

Are there any good reasons, then, to think that backward causation is really possible? Here we find little help from Dummett's discussion or those of his respondents. For Dummett himself contends that backward causation is really impossible, and his illustrations to show its logical possibility must have recourse to magic. Scriven provides no evidence that his psychic experiment is really possible. Chisholm and Taylor argue that one may properly regard chronologically posterior sufficient conditions as causes of earlier events, but Dray's refutation seems adequate to turn back the force of their argument.[41] When we say $A$ causes $B$ we do not mean merely $A \cdot \sim B$ is impossible.

At the heart of Chisholm and Taylor's argument lies an inadequate conception of causality merely in terms of sufficient conditions.[42] As Taylor came to see, the conditions approach to causality is simply implausible because it does not distinguish between cause and effect: $A$ and $B$ are both necessary and sufficient for each other. But plainly, the match's igniting is not the cause of its being struck, the stone's growing warm is not the cause of the sun's shining on it, a man's being drunk is not the cause of alcohol in his blood—this despite the fact that both constitute the necessary and sufficient conditions for each other. One event is not named "cause" merely because it is earlier: "It seems fairly clear that there is something metaphysically absurd, and not merely an inept choice of words, in supposing that efficient causes might work backwards. There is surely some reason why nothing can produce an effect in the past, and the reason cannot just be, that if it did, we would not then *call* it a cause."[43] Refuting his own earlier illustration, Taylor asks, who is to blame for the death of a political rival, the man who shoots him or the man who attends his funeral? Though both represent sufficient conditions, only the first is an active, productive cause. Thus it seems clear that Chisholm and Taylor's previous piece constitutes no proof of backward causation.

Nevertheless, there is alleged evidence for backward causation, or at least its physical possibility in various fields of science, in the phenomenon of precognition in parapsychology, and in thought experiments concerning time travel. Accordingly, we shall wish to look at each of these areas.

### Neural Physiology
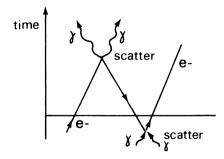
It has been argued that various phenomena in the natural sciences provide evidence for backward causation. In the field of neural physiology, for example, instances of backward causation have been claimed. Von Wright argues that in performing a basic action like lifting his arm, one affects the past.[44] For in lifting his arm, one retroactively causes events in his brain and nervous system which occur prior to his arm's rising. Since lifting one's arm is a basic action, one does not move his arm as a result of some prior action, and thus it must be regarded as a retro-cause. Beauchamp and Robinson, however, dismiss this example, for they point out that the parallelism of causation and time may be restored through a physiological explanation of the arm's movement.[45] There are first neural correlates associated with intention, followed by correlates of activity in the motor cortex of the brain. Hence, no genuine instance of backward causation occurs. Robinson

describes a different mental phenomenon which seems to lend more support to backward causation than Von Wright's example, namely, the phenomenon of "backward masking."[46] This pertains to the ability of a larger and more intense stimulus to preclude the perception of another stimulus occurring earlier in time. An experiment is constructed such that a small disc of light is followed at intervals of 50-200 milliseconds (a long time in photo-chemical terms) by a larger and more intense flash, which precludes the patient's earlier perception of the disc of light. Beauchamp and Robinson, however, again point out that the difficulty disappears when one recognizes the different neural factors at play.[47] For fibers of the optic nerve with a larger diameter carry signals to the "visual" brain faster than do smaller fibers, so that it is entirely possible for a physically earlier stimulus to be neurally later than a later stimulus traveling more quickly to the brain. Hence, no appeal to backward causation need be made in the case of backward masking.

### Particle Pair Creation/Annihilation

The late Richard Feynman proposed in 1949 a retro-causal interpretation of so-called particle pair creation and annihilation in sub-atomic physics.[48] Normally this phenomenon is understood as the transmutation of particles into radiation or *vice versa*, as the collision of an electron and its anti-matter correlate a positron transforms the particles into gamma rays or the collision of two gamma rays results in their transformation into an electron-positron pair:

time

γ  γ   pair annihilation

e-  e+  e-

pair creation

γ  γ

Feynman, however, suggested that this phenomenon be represented as the history of a single ordinary electron traveling back and forth in time:



According to this interpretation, the electron travels forward in time until a point at which its emission of gamma rays causes it to recoil and travel backward into the past until such time as it is struck by gamma rays, whose impact sends it traveling forward into the future again. Thus, there exist neither positrons nor particle pair creation or annihilation, but simply a single time-traveling particle. Feynman's interpretation would appear to involve backward causation in that the emission of gamma radiation at some time $t_n$ is the cause of the electron's being at some earlier $t_{n-1}$.

But Feyman's reinterpretation of particle pair creation/annihilation seems purely conventional and has generated no following among physicists. Jonathan Powers comments,

> However, since it is purely a matter of convention whether we call electrons or positrons 'anti-matter,' it would appear to be a purely arbitrary matter which are regarded as 'going backwards in time.' If so, then this sort of talk can hardly have any factual import . . . . The simplest interpretation is to say that the 'arrows' on Feynman's particles have nothing to do with 'direction in time' but are simply an idiosyncratic convention for representing the difference between positive and negative charges.[49]

Feynman's interpretation, then, can hardly be said to prove the possibility of, much less provide evidence for, backward causation.

### Classical Electrodynamics

More serious claims for evidence of backward causation have been made in the field of classical electrodynamics.[50] The work of P. A. M. Dirac in non-quantum electrodynamics (relativistic and pre-relativistic) has been interpreted to hold that the acceleration exhibited by

a particle of a given mass and charge (say, an electron) before any force acts on it is related functionally to the forces which then act on the particle at a later time or times such that these future forces can be held to be the asymmetric, retroactive cause of the particle's pre-acceleration.

Grünbaum, however, has subjected this interpretation of Dirac's work to searching criticism, calling it the "myth of retrocausation in classical electrodynamics."[51] According to Grünbaum, the "unexamined and alluring" tacit assumption of this interpretation is that the mere fact of this mathematical dependence enables the forces of Dirac's theory to qualify as the asymmetric cause of the pre-acceleration.[52] *Contra* this assumption, he maintains that the functional dependence of the pre-acceleration of a charged particle on the subsequently applied forces in Dirac's theory does not have the law-like character required for qualifying either as asymmetrically or even symmetrically causal; instead this functional dependence is predicated on the imposition of a purely *de facto* boundary condition. Therefore, ". . . the non-zero acceleration of such a particle is not causally connected at all as such to the applied forces. And thus these forces are neither retrocauses nor temporally prior (a tergo) causes of acceleration."[53]

By way of preliminary observation, Grünbaum notes that within classical electrodynamics, the relevant law of motion for the non-relativistic form of Dirac's theory is supplied by the Abraham-Lorentz equation, while in the relativistic version the relevant law is expressed in the Dirac-Lorentz equation. These serve as a point of departure for those Diracian equations which are the basis for the claim that classical electrodynamics involves backward causation. But neither of these equations are fundamental laws of nature. If they are disallowed as laws of motion, states Grünbaum, then the issue of retrocausation does not even arise. Still, he is willing to assume that these are laws and argues that even on that assumption backward causation does not follow.

The Abraham-Lorentz law equation requires for its solution an additional adjustable constant, namely, the "initial" value $a(t_o)$ of the acceleration at some moment $t_o$. To say the constant is adjustable means that its value is not determined as a matter of physical law by the values of other dynamical magnitudes such as $f(t)$ [force at time $t$] and $m$ [mass], but has the status of a constant of integration. Let us suppose then that $f(t) = 0$, that is to say, no external force is applied to the particle. The equations dictate that the particle will continue to accelerate anyway toward infinity. "Even if no force is ever ap-

plied to the particle—so that $f(t) = 0$ for *all* times $t$—the particle's
acceleration will go to infinity with indefinitely increasing values of
$t$ . . . . according to the pertinent force-law, even the application
of a force $f(t) \neq 0$ for at least some instant $t$ or other is NOT a NEC-
ESSARY condition for having the particle accelerate at all times!"[54]
In relativistic classical electrodynamics, the run-away motions do not
supersede the speed of light; the velocities of the particle motions in-
crease asymptotically toward the speed of light as $t \to \infty$, even when no
force is applied to the particle. The only way of ruling out such run-
away or self-accelerated behavior is to impose the requirement that
the constant of integration $\dot{v}(t_o)$ has the value zero, that is to say, by
stipulating that the particle has no "initial" acceleration. But this
value assignment has the non-lawlike, *de facto* status of being a mere
initial or boundary condition: "this requirement has the status of a
*non-lawlike* and *de facto* condition in virtue of being a specification
of the value of a constant of integration in this dynamical theory."[55]

Let us then suppose that our equations have an application of non-
zero forces $f(t_o) \neq 0$. It remains the case that the value of $\dot{v}(t_o)$ is not
determined as a matter of physical law alone by $f(t_o)$ itself or even
by the values of $f(t)$ for all times $t$ taken by themselves. It is still a
*de facto* boundary condition. Just as the application of such forces is
not a necessary condition for $\dot{v}(t) \neq 0$, neither is it, in the absence of
further *de facto* boundary conditions, a lawfully sufficient condition
for the particle's having a non-zero acceleration $v(t)$ at the time $t$.
Regardless of whether the non-zero forces are applied before or after
the time $t$, they are neither a lawfully necessary nor lawfully sufficient
condition for the particle's possession of a non-zero acceleration at $t$.
But if a boundary condition is given as to the value of $\dot{v}(t_o)$ for a
time $t_o$ *before* $t$, then the acceleration $v(t)$ of the particle at $t$ becomes
a mathematical function of the *earlier* forces. In this sense we can
say that once $\dot{v}(t_o)$ is given for a time $r_o < t$, the earlier forces "pre-
determine" the acceleration at $t$. On the other hand, if a boundary
condition is given as to the value of $\dot{v}(t_o)$ for a time $t_o$ *after* $t$, then
the acceleration $\dot{v}(t)$ at time $t$ becomes a mathematical function of
the *later* forces. In this sense we can say that once $\dot{v}(t_o)$ is given for a
time $t_o > t$, the later forces "retrodetermine" the acceleration at time
$t$. Thus, depending on whether the boundary condition specifying
the value of $\dot{v}(t_o)$ pertains to the past or to the future of time $t$, the
specification of $\dot{v}(t_o)$ enables the past or the future forces respectively
to determine $\dot{v}(t)$.

Grünbaum draws an interesting parallel with Newtonian mechan-
ics. Just as in Newtonian mechanics the non-zero forces alone are

neither lawfully sufficient nor lawfully necessary for a particle's non-zero *velocity*, so in Abraham-Lorentz electrodynamics the non-zero forces are neither lawfully sufficient nor lawfully necessary for a particle's non-zero *acceleration*. Suppose that we impose a boundary condition on a Newtonian particle such that as $t \to \infty$, $v(t) \to 0$. "Once the specified futuristic boundary condition is imposed, a Newtonian particle can have a non-zero PREvelocity at a time $t$ such that this non-zero prevelocity is mathematically a function of non-zero forces which will first be acting on the particle after $t$. In short, if non-zero future forces slow a particle down to zero velocity, then their time integral determines the particle's present non-zero velocity."[56] (Or we can impose a past boundary condition such that a Newtonian particle can have a non-zero POSTvelocity at a time $t$ such that this is a function of non-zero forces which acted on the particle only before $t$.) Now, queries Grünbaum, would champions of retrocausation say this warrants the claim that the non-zero forces which are first applied to the particle after time $t$ are collectively the asymmetric cause of the particle's possession of a non-zero prevelocity at the earlier time $t$? Does Newtonian mechanics therefore furnish a *bona fide* example of backward causation? Would they not recoil at the thought, claiming the action of future forces is itself neither a lawfully necessary nor lawfully sufficient condition for the particle's possession of a non-zero prevelocity as such at time $t$? So why does the same not apply to pre-acceleration?

Finally, Grünbaum demands whether Dirac's functional dependence of the preacceleration on later forces qualifies at all as causal. In Dirac's electrodynamics, non-zero accelerations as such are not attributable to earlier, later, or simultaneous forces because non-zero electrodynamic accelerations as such are not causally connected at all to the applied forces. Writers who find themselves driven to espouse electrodynamic retrocausation err in interpreting the *mathematical* dependence of acceleration on force in the equations as being a causal dependence as well. But as Grünbaum puts it, "Mathematical retrodetermination of the preacceleration by the later forces . . . is not tantamount to retrocausation . . . ."[57] Someone may ask, then what is the cause of the preacceleration? But this question is predicated on an assumption denied by the theory itself: that the occurrence of a non-zero acceleration as such lawfully requires the action of an external agency or perturbational cause at all! Just as Newtonian physics disavowed the neo-Aristotelian notion that non-zero velocities as such lawfully require external or perturbational causes, so classical electrodynamics denies in the case of charged particles that non-zero

accelerations as such lawfully require external agents or perturbational causes. Dirac's contribution to classical electrodynamics is a great scientific achievement, concludes Grünbaum, "But its import for the conceptual let alone physical possibility of retrocausation is nil."[58] It would seem, therefore, that Dirac's electrodynamics do not provide clear evidence for backward causation.

### *Tachyons*

#### Superluminal Particles and Backward Causation

Special relativity theory provides the context for yet another candidate for backward causation in the natural realm. When Einstein proposed his Special Theory of Relativity in 1905, he conceived of the speed of light $c$ as a limiting velocity such that transmission of energy from point to point in spacetime at super-luminal velocities is impossible: ". . . velocities greater than that of light," he concludes, "have no possibility of existence."[59] This is because the mass of a particle would become infinitely large as its velocity approaches $c$. The speed of light was therefore conceived to be an inviolable barrier for particle velocities. In the second half of this century, however, physicists such as O.-M. Bilaniuk, V. K. Deshpande, E. C. G. Sudarshan, and G. Feinberg realized that Einstein's conclusion was overdrawn.[60] While his equations prohibited the *acceleration* of particles traveling at subluminal velocities to or beyond $c$, they did not preclude the existence of particles whose velocities are *always* $>c$. After all, photons and neutrinos both travel with a velocity equal to $c$ without ever having been accelerated from a subluminal speed to luminal velocity. So why could there not exist particles which travel at superluminal velocities without ever having been accelerated from speeds $<c$? In this case the speed of light remains an inviolable barrier, but that does not preclude the existence of particles on the other side of the barrier. Feinberg called such particles "tachyons," from ταχύς ("swift"), and the experimental search for these exotic entities was on.

If tachyons do exist, they are, indeed, exotic. In order to satisfy the Einstein equations, the proper (or rest) mass of a superluminal particle would have to be expressed by an imaginary number, that is, some real number $n$ times $\sqrt{-1}$. But what does it mean to say that the proper mass of a tachyon is represented by an imaginary number? Acknowledging that no physical significance can be attached to an imaginary number, Bilaniuk and Sudarshan nevertheless point out that the proper mass of a superluminal particle is a parameter

devoid of any immediate physical significance and may therefore be
expressed by such a number.[61] Analogously, we are accustomed to
talking about luminal particles' having a zero rest mass. In a labo-
ratory traveling at $c$, a luminal particle would be at rest and, having
no proper mass, would therefore seem to vanish. The paradox cannot
arise, however, since it is impossible for objects like the laboratory
to travel at anything other than subluminal velocities. Similarly, the
proper mass of a superluminal particle does not describe any physical
state of affairs and may therefore be expressed via an imaginary pa-
rameter. They note that physics abounds in such parameters; what
must remain real is the energy and mass of the particle *as they appear
to an observer*. Both of these will be real if we take the proper mass
to be an imaginary number. Bilaniuk and Sudarshan also note that
not only the proper mass, but also the proper lengths and proper life-
times of tachyons would have to be imaginary parameters. But they
insist that since such quantities are not accessible to measurement,
no problem is created by expressing them as imaginary numbers. The
queerness of tachyons is far from exhausted by this, however. For the
equations for energy and momentum for such particles reveal that
tachyons would accelerate as they *lose* energy. Tachyons traveling at
infinite velocity would possess no energy at all. Conversely, when-
ever energy were imparted to a tachyon, it would *decelerate*. In order
to slow a tachyon down to its lowest possible velocity, $c$, an infinite
amount of energy would be required. This leads to one of the most
peculiar characteristics of tachyons: their *prima facie* possession of
negative energy. Let an observer at rest in a reference frame $S$ observe
a tachyon traveling with a velocity $v$ relative to him. This same parti-
cle will travel with a different velocity $u$ relative to another observer in
a reference frame $S'$ which is moving with respect to $S$ with a velocity
$w$. When the product $vw$ exceeds $c^2$, the tachyon will possess negative
energy relative to $S'$. But the occurrence of negative-energy states
for particles has always been objectionable for scientists, Feinberg ad-
mits, because no other system could be stable against the emission
of such negative-energy particles, an entirely unphysical behavior.[62]
More peculiar still, such particles seem to travel backward in time.
To the observer in $S'$ the negative energy particle would appear to be
absorbed first and emitted later. The implications of such behavior
were noticed by Richard Tolman as early as 1917 in what has come
to be known as Tolman's Paradox; namely, communication with the
past is possible.[63] Let an observer $O$ in a reference frame $S$ send out
a burst of infinitely fast tachyons at $t_1$ to an observer $O'$ in a ref-
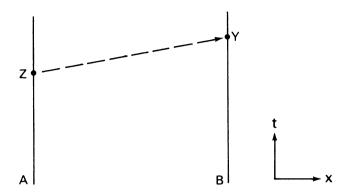erence frame $S'$ which is receding from $S$ at the uniform velocity $w$.

The reception of the tachyon signal in $S'$ triggers a similar burst of tachyons back to $O$ that travel with an infinite velocity relative to $S'$. The relativity equations dictate that the second signal arrives in $S$ at a time $t_o$ *before* the burst of tachyons is sent at $t_1$. But since the signal from $O'$ to $S$ was triggered by the signal from $O$ to $S'$, it follows that the effect ($O$'s reception of $O'$'s signal) precedes the cause ($O$'s sending his signal to $O'$) in $S$, or in other words, tachyons furnish the mechanism for backward causation.

## The Reinterpretation Principle
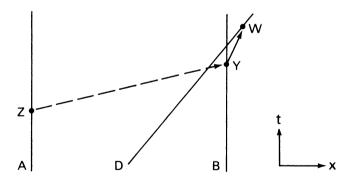
This implication alone was enough to warrant the rejection of the possibility of tachyons in the minds of many physicists. S. Yoshikawa, for example, charged that "If we can control the interaction between a tachyon and other particles in any way (such as blocking the motion of a tachyon), we can violate the causality principle,"[64] by which he means that an effect might precede its cause. F. A. E. Pirani concluded that such a "causality violation" implies "that a classical-particle description of tachyons is not physically viable."[65] Proponents of tachyons felt at first constrained to explain away Tolman's Paradox with its attendant backward causation by means of a "reinterpretation principle." "It is precisely by putting together, the two quizzical concepts of '*negative-energy*' particles traveling '*backward in time*' that the resolution of the difficulty is found," state Bilaniuk and Sudarshan; "A 'negative-energy' particle that has been absorbed first and emitted later is nothing else but a positive-energy particle emitted first and absorbed later, a perfectly normal situation."[66] By interpreting any negative energy particle moving backward in time as a positive energy particle moving forward in time, one may thereby eliminate the occurrence of an effect before its cause. In our previous case, for example, $O'$ will naturally regard the tachyon beam received from $S$ as actually a signal which he is himself sending to $S$. Similarly $O$ will regard the tachyon beam received from $S'$ as a signal which he is himself sending to $S'$. $O'$ and $O$ will regard these beams as spontaneous emissions from their own tachyon transmitters rather than as receptions from another reference frame. Feinberg concludes,

> Therefore, while it does appear possible to construct kinematic closed cycles using tachyons in which signals are sent back to the past, a careful examine [*sic*] of the methods of detection, with due regard to the interpretation of absorption of negative-energy tachyons as emission of positive-energy tachyons, leads to the conclusion that such closed cycles will not be interpreted as reciprocal signaling, but rather as uncorrelated spontaneous emission. It therefore does not appear that causal anomalies can be used as an argument against the existence of tachyons.[67]
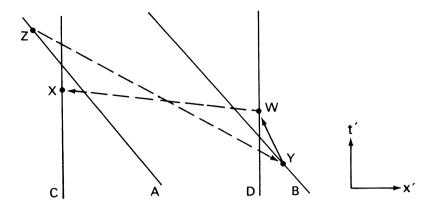
Now at face value, the reinterpretation principle sounds merely like the endorsement of what can only be characterized as a fantastic delusion. If $O$'s tachyon signal really does trigger $O'$'s transmitter to send a return signal, then it is simply irrelevant to the issue of backward causation whether $O$ or $O'$ *believes* that backward causation has occurred. Feinberg seems to grant as much. But in that case, how is the causal anomaly removed? If backward causation is in some way objectionable or impossible, then such a problem remains regardless of the (mis)apprehensions of the observers. Or do supporters of tachyons mean to assert that the observers' beliefs somehow affect the actual causal connections that obtain between events? Bilaniuk and Sudarshan seem to suggest as much, claiming when the reinterpretation principle is invoked, ". . . the causal circle breaks down. There is no more back and forth exchange of signals. In each case the observer believes that he is sending out both signals."[68] If they mean to assert that because each observer *believes* he is sending both signals, therefore he is sending both signals, so that no exchange takes place and hence no causal loop is formed, then this constitutes a most implausible anti-realism. It seems incredible that one's beliefs should determine whether the tachyons traveled from $S$ to $S'$ or the reverse. Indeed, beliefs as such seem entirely irrelevant to causal directionality, for the situation envisioned could exist without sentient observers at all, but merely machines.[69] A more plausible interpretation of Bilaniuk and Sudarshan's remarks would be that the causal relation is itself relative to reference frames, that is to say, there is no absolute causal directionality in the same way that there is no absolute simultaneity according to Special Relativity. The world-line of the tachyon burst simply *exists* (tenselessly) between space-time points in $S$ and $S'$, and whether the tachyons are moving from $S$ to $S'$ or *vice versa* is observer-dependent, as is also which event is conceived to be the cause and which the effect. But even this interpretation of the reinterpretation principle will not do, for as has been often pointed out, even under the invocation of that principle there are cases in which the effect will precede its cause.[70] DeWitt, for example, asks us to imagine two observers $A$ and $B$, both at rest in an inertial frame designated by the coordinates, $x$, $t$. Let $A$ send a tachyon beam at the space time point $Z$ to $B$ at point $Y$. Since in the common inertial frame of $A$ and $B$, $Y$ is later than $Z$, both observers agree that $A$ has sent a positive energy beam to $B$:
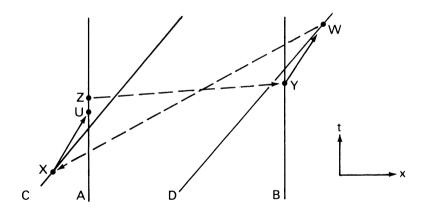
Now suppose a third observer $D$ passes by $B$ near point $Y$ traveling at a relative velocity less than $c$. As they pass, $B$ transmits to $D$ by means of a photon signal the information he had received from $A$. Since photons are conventional information carriers, no ambiguity exists as to who is transmitting and who is receiving:



Now let $D$ send via a tachyon signal from point $W$ the information received from $B$ to a fourth observer $C$, who is at rest relative to $D$ but who is passing by $A$ at some point $X$ prior to $Z$. Again, in their common inertial frame denoted by $x'$, $t'$, $C$ and $D$ agree that $D$ is the transmitter and $C$ the receiver since $X$ is later than $W$.

Finally, let $C$ transmit to $A$ by means of a photon signal the information he had received from $D$. $A$ will have no disagreement that the signal was received from $D$, and yet he will thus receive at some point $U$ prior to $Z$ information which he has not yet sent:



One will in vain invoke the reinterpretation principle in such a case, since each observer pair agreed who was the transmitter and who the receiver. Therefore, backward causation cannot be eluded by means of reinterpreting negative energy particles moving backward in time as positive energy particles moving forward in time.

Moreover, the notion that causal directionality is relative to reference frames seems clearly untenable. In their engaging discussion of a tachyonic antitelephone, Benford, Book, and Newcomb point out that causal directionality is independent of temporal considerations and is therefore not susceptible to arbitrary reinterpretation:

> For example, let $A$ be William Shakespeare and $B$ Francis Bacon, and let
> $V'$ [the outgoing tachyonic velocity] be negative. If Shakespeare types out
> *Hamlet* on his tachyon transmitter, Bacon receives the transmission at
> some earlier time. But no amount of reinterpretation will make Bacon the
> author of *Hamlet*. It is Shakespeare, not Bacon, who exercises control
> over the content of the message.[71]

Thus, ". . . the direction of *information transfer* is necessarily
a relativistic invariant. An author's signature, for example, would
always constitute an invariant indication of the source."[72] The rein-
terpretation principle is thus seen to be essentially an exercise in
self-delusion: causal directionality is invariant across reference frames
and to interpret events as related other than as they are amounts to
self-deception.

In light of these facts, proponents of tachyons began to reassess
whether backward causation was after all so objectionable or paradox-
ical. R. G. Newton asserted that while the existence of tachyons has
the consequence that an effect might precede its cause, this does not
prove that their existence is either impossible or logically contradicto-
ry.[73] Nor, he adds, is causality itself endangered, for causal direction-
ality is determined, not by temporal precedence, but by invariant (or
statistical) correlation between the occurrence of one event and an-
other. Bilaniuk and Sudarshan seemed to draw comfort from the fact
that there are "serious physicists" who "shrug off the causality objec-
tion by simply saying, 'So what?' . . . They feel that no precepts of
logic would be violated if the temporal order of cause and effect were
sometimes reversed."[74] We have seen that attempts to find a logical
contradiction in the notion of backward causation do seem to have
failed; therefore, any dismissal of the existence of tachyons on the ba-
sis of logical objections to backward causation is indeed unjustified.
The tachyon adherent could therefore simply embrace the retrocausal
implications of faster than light particles unless some further problem
were shown to be thereby entailed.

Some writers, interestingly enough, believe that the problem en-
tailed by permitting tachyonic backward causation is fatalism. Fein-
berg, for example, called this the "most serious qualitative objection"
to tachyons; the transmission of signals into the past of a single ob-
server "is in apparent conflict with the natural view that one is free
to decide whether or not to carry out an experiment up until the
time that one actually does so."[75] The objection seems to be that
one could, for example, call oneself in the past on a tachyonic an-
titelephone and then after receiving the call decide not to place the
call after all. By now, however, the answer to this objection has be-
come clear: the fact that one has received a call from himself does not

entail that one is not free to refrain from placing the call, but only that he will not in fact refrain from placing it.[76] Thus, no fatalistic paradox is generated by the existence of negative energy tachyons.

### The Logically Pernicious Self-Inhibitor

But the proponents of tachyons are far from off the hook. A more substantive objection appears to arise when one considers cases in which tachyonic backward causation would entail the existence of what Fitzgerald has called a "logically pernicious self-inhibitor."[77] Benford, Book, and Newcomb invite us, for example, to envisage a situation in which observers A and B enter into the following agreement: A will send at 3:00 a tachyonic message to reach B at 2:00 if and only if he does not receive a message from B at 1:00. B will send at 2:00 a message to reach A at 1:00 if and only if he receives a message from A at 2:00. Therefore, the exchange of messages takes place if and only if it does not take place. They conclude that "Unless some truly radical solution is found to this paradox, we must conclude that tachyon experiments [such as those being currently carried out] can only yield negative results."[78] Earman points out that such paradoxes do not depend on human agency, but may be constructed solely with machines. Thus, the reinterpretation principle is irrelevant. "*A contradiction is generated by asking whether a certain event occurs; we find that it occurs if and only if it does not occur.*"[79] While the tachyon event might be interpreted differently by different observers, this difference is totally irrelevant to the contradictory nature of the conclusion.

Now it is not the existence of tachyons as such, admits Earman, that entails the possibility of a logically pernicious self-inhibitor; rather it is the whole situation which is impossible, and this includes assumptions concerning the possibility of controlling tachyon beams, of detecting them, and so forth. By giving up one or some of these other assumptions, one may impose consistency conditions on hypothetical cases so that the paradox cannot arise. In his original paper on tachyons, Feinberg attempted to circumvent objections based on communication with one's past by arguing precisely that such a paradox does not warrant the conclusion that tachyons do not exist, but only that tachyons cannot be used to send reliable signals in the sense that one cannot control the outcome of an experiment to produce or absorb them.[80] Similarly, Fitzgerald maintains that we must only conclude that tachyons cannot be controlled in all the ways required for the self-inhibitor to function.[81] When asked why such machines fail, he responds that it may be either for empirical reasons involving

constructibility or controllability or due to a fortuitous set of acci-
dents each time one tries the experiment. The difficulty with the
attempt to impose consistency conditions based on considerations of
constructibility and controllability, however, is, as Earman explains,
that we have good reason to believe that such devices are possible.
The assertion that such experiments cannot be carried out is there-
fore "brazen," since the experiments involve "only operations which
we know to be possible in our world."[82] Since such devices as are re-
quired for these experiments are apparently nomologically possible, it
follows that tachyons are nomologically impossible and therefore do
not exist. The threat of fortuitous accidents preventing such exper-
imentation seems utterly implausible, for as Fitzgerald himself con-
fesses, we should then have to posit a lawlike regularity of accidents to
prevent the functioning of a machine which should be constructible
if tachyons exist.[83] Hence, the conclusion of the foregoing analysis
would seem to be that given the nomological possibility of tachyon
emitters and detectors, one cannot avoid the paradoxes by denying
assumptions concerning such devices, but is led instead to denying
the possibility of the existence of tachyons. While this reasoning has,
to my knowledge, gone unchallenged in the tachyon literature, there
is within the body of literature discussed in the time travel section
below a significant challenge to the modal validity of inferring from
the nomological possibility of such devices that tachyons are impos-
sible. But that challenge may be reserved for our discussion of that
section; here we wish to explore more deeply whether the paradoxes
might be avoided in some other way.

There are, for example, some even more fundamental assumptions
which a proponent of tachyons might be willing to give up in order to
maintain their nomological possibility. For example, he could try to
save the situation by postulating that tachyons are non-interacting
particles, so that the paradoxical situation cannot arise. But in so
doing, one thereby abandons any claim that tachyons demonstrate
the possibility of backward causation, for no interaction of any sort
is possible. Thus, if tachyons are conceived to be particles capable
of facilitating backward causation, it seems that since their modula-
tion and detection is nomologically possible, their existence must be
nomologically impossible, if the paradoxes are to be avoided.

### A Perspectival Special Theory of Relativity

But there is still one more way of escape for the tachyonite, an escape
that may appear to some the most radical of all: *he may interpret
the Special Theory of Relativity purely perspectivally, positing some*

*universal, preferential reference frame which determines absolute si-
multaneity in a cosmic time.* The Special Theory of Relativity asserts
relativity of simultaneity, based upon a redefinition of the traditional
notion of simultaneity in terms of reception of light signals. The rela-
tivity of simultaneity is easily eliminable within the theory, however,
by conventionally positing some preferential reference frame which
serves to determine simultaneity non-relatively for all events, which
themselves possess relations of only relative simultaneity among var-
ious, non-preferential reference frames. Being conventional, however,
the choice of any one reference frame in preference to some other lacks
any objective warrant, and thus seems contrary to the spirit of special
relativity theory. But if tachyons exist, as Salmon points out, they
furnish the means of designating some preferential reference frame
non-conventionally.[84] This is because superluminal signals could be
employed to establish absolute synchrony between clocks at different
places and thus establish absolute simultaneity. For if any arbitrarily
fast signal from $A$ must be sent prior to some event $e_1$ at $A$ in order
to reach $B$ by the time some event $e_2$ at $B$ occurs, and if any arbi-
trarily fast signal from $B$ must be sent prior to $e_2$ in order to reach
$A$ by the time $e_1$ occurs, then it has been established that $e_1$ and $e_2$
are absolutely simultaneous. If in some reference frame, $e_1$ and $e_2$
are not observed to be simultaneous, then the observer would know
that this nonsimultaneity was merely perspectival due to his relative
motion with respect to the preferred reference frame established by
the tachyon signals. In this case, the paradoxes do not arise because,
given the preferential frame of reference, tachyons do not travel back
in time, as they move from $A$ to $B$. Salmon concludes that ". . .
we are faced with the following dilemma: either tachyons cannot be
used to send messages (and if not, why not?) or they can be used to
establish absolute synchrony and absolute simultaneity, thereby elim-
inating the relativity of simultaneity which is so fundamental to the
entire special theory."[85] The Special Theory of Relativity need not,
however, be regarded in that case as overthrown; rather it need only
be interpreted perspectivally instead of (for want of a better word)
ontologically, or absolutely. Bilaniuk and Sudarshan, who in the end
opt for this route, confront the challenge that such an interpretation
violates the spirit of special relativity theory:

> After all, is not the exclusion of a preferred frame what relativity is all
> about? *No, it is not.* The postulates of special relativity require the
> laws of physics, including the speed of light, to be the same in all inertial
> frames. They do not preclude the existence of cosmological boundary
> conditions that permit us to single out a particular local frame as a
> preferred reference system. For example, the frame of reference in which

the cosmic 3-K black-body radiation is isotropic could be considered a preferred frame that can be distinguished from all other frames.[86]

Here the preferred frame of reference is determined by a radiation background generated within a few minutes after the Big Bang and hence co-extensive with the universe. Such a designation serves to remind us that Einstein's special theory was drafted and proposed prior to the discovery of the expansion of the universe, at a time when the universe as a whole was conceived to be beginningless and static. By redefining simultaneity in terms of light signal synchronization of clocks, Einstein appeared to eliminate any warrant for a preferred reference frame or for a cosmic time. With the subsequent discovery of the universe's expansion from a past point of singularity, however, the issue of a universal, preferred frame of reference and hence a cosmic time resurfaced. G. J. Whitrow comments,

> The concept of the relativity of simultaneity on which, in 1905, Einstein based his Special Theory of Relativity at first appeared to eliminate from physics any idea of an objective world-wide lapse of time according to which physical reality could be regarded as a linear succession of temporal states or layers. Instead, each observer was regarded as having his own sequence of temporal states and none of these could claim the prerogative of representing the objective lapse of time. Nevertheless, a quarter of a century later, theoretical cosmologists who made use of the physical ideas and mathematical techniques associated with relativity theory were led . . . to re-introduce the very concept which Einstein had begun by rejecting.[87]

The expansion of the universe itself serves to establish, as it were, the existence of a cosmic clock and a continuous temporal sequence of events back to the point of singularity. The relativity of simultaneity postulated by the special theory is therefore perspectival. "In a universe characterized by the existence of a cosmic time," concludes Whitrow, "relativity is reduced to a local phenomenon, since this time is world-wide and independent of the observer."[88] Such is, I think, the most plausible position available to the A-theorist of time: there exists a cosmic time which is determinative for which events are absolutely past, present, or yet to happen (see Appendix I). The positing of some preferential frame of reference, therefore, should not be thought to undermine the Special Theory of Relativity or to contradict the empirical evidence for it. As Salmon admits, the designation of some privileged frame of reference used to establish relations of absolute simultaneity between events would not lead to any refutable claims.[89]

But if the perspectival interpretation of the Special Theory of Relativity enables the tachyon enthusiast to retain belief in the possibility

of their existence, all this is of no comfort to the proponent of backward causation. For since on the perspectival interpretation, tachyons do not travel backward in time, neither do they retroactively cause events to occur. Should experimental evidence for tachyons emerge, this would furnish evidence, not for backward causation, but for the perspectival interpretation of special relativity according to which tachyons do not act as retro-causes. The conclusion of this discussion would therefore seem to be that the possibility of the existence of superluminal particles says nothing in favor of the possibility of backward causation.

## *Precognition*

Moving into the quite different field of parapsychology, we wish to inquire whether, as is often asserted, the phenomenon of precognition furnishes evidence of backward causation.[90] Parapsychology studies phenomena which cannot be explained merely in terms of physical principles, phenomena which fall into two divisions: extra-sensory perception (ESP) and psychokinesis. Psychokinesis involves influencing an object without physical intermediaries; ESP may be further subdivided into clairvoyance, telepathy, and precognition. Clairvoyance and telepathy involve supernormal cognitions of contemporaneous events, precognition is a supernormal cognition of future events.

## Experimental Evidence

Though some philosophers are apt to dismiss parapsychological studies as fantastic, the evidence can be impressive. Already in 1937, C. D. Broad felt compelled to admit that precognition is worthy of serious consideration *unless* there be some logical or metaphysical impossibility in it.[91] Scriven's illustration of backward causation, for example, was no doubt insired by the picture-hanging experiments of Whately Carrington conducted at Cambridge in the late thirties.[92] On ten successive evenings, Carrington hung in his study a sketch of some object which remained on the wall from seven o'clock that evening until half past nine the following morning. In the meantime, persons in England, Scotland, Holland, and the United States attempted to produce an identical drawing via telepathy. The results of the experiment failed to show any telepathic perception of the drawing hanging on the wall at the time the attempted reproductions were made. Curiously, however, there was a remarkable resemblance between the persons' drawings and the drawings which Carrington had

hung on the wall the previous two evenings and the drawings which he was to hang on the wall the subsequent two evenings. Although the subjects had failed to guess the drawing on the same evening, they had thus displayed an accuracy *vis à vis* the two previous and two subsequent drawings which Carrington calculated could result from chance in only one case out of 10,000. There thus appeared to be good evidence for precognition, for Carrington did not determine the subject of the drawing until just before seven o'clock each evening and he did so by means of a randomizing procedure—opening a book of mathematical tables at random, picking the last digits of the first two or three groups of numbers he saw, turning to the corresponding page of a dictionary, and then selecting the first appropriate word on that page—which would have made prediction impossible.

Even more remarkable are the experiments conducted by S. G. Soal with Basil Shackleton.[93] Soal had conducted card-guessing experiments with 160 persons and failed to find anything more than chance "hits." But in 1939, Carrington, after publishing his results, urged Soal to re-examine his case-studies to see if any similar phenomena of retro- or precognition characterized his findings. Soal reluctantly re-examined his records and to his surprise found that two of the subjects did, indeed, exhibit a similar pattern of accurate guessing with regard to the preceding (-1) and subsequent (+1) card turned. Soal carried out further experiments with each of these subjects, those with Shackleton continuing for two years. In these experiments, Shackleton was told the names of five different animals pictured on separate cards. As a "telepathic agent" looked at each of the cards in a random order, Shackleton was, upon signal, to write down which animal the agent was viewing. Soal found that with three of the thirteen agents Shackleton scored statistically significant +1 hits. With two of these agents, Shackleton made a total of 5,799 guesses, 1,679 of which were +1 hits. This represents 28.95% of the total, which is admittedly not a very strong positive association. Moreover, 1,160 is the most probable number of +1 hits made by sheer chance, or 20% of the total. The difference of 519 represents, nevertheless, a deviation so pronounced that the odds of its occurring by mere coincidence are one in $2.4 \times 10^{63}$. Though the positive association is not very strong, it is very persistent: "...it is so persistent that the odds against so strong an association persisting us a mere chance-coincidence, in a run of guesses so long as that actually made, are colossal. They are such as to rule out that hypothesis completely. It is for this reason that we say that the results of these experiments seem *prima facie* to establish the occurrence of 'precognition' on the part of Mr. Shackleton."[94]

More recent experiments, exemplified by those of H. Schmidt, have relied on electronic machinery for the presentation and randomizing of target sequences. Schmidt used four colored lights as targets, the subject being instructed to indicate which lamp would light next by pressing the appropriate button.[95] An electronic switch which designated each light 250,000 times every second determined which one lit up when the subject pressed the button. Between pressing the button and the switch's closure there was a delay of one tenth of a second. The precise length of this delay was determined by random decay of a piece of radioactive strontium 90. In one experimental run, three subjects making a total of 63,066 guesses exceeded chance expectation by just over 690 hits. The chance odds of such a result are 500 million to one. In another series of 20,000 guesses, four subjects were instructed to designate which lamp would not light. So significant were the results that the odds of their occurring by chance were ten billion to one. Similar results were obtained by E. F. Kelly and B. K. Kanthamami, using Schmidt's machine to test a gifted subject.[96] R. Targ and D. B. Hunt ran similar experiments with a ten year old girl, who was so successful that the odds against obtaining their results by chance were $10^{15}$ to one.[97] On the basis of these and similar experiments, Brier concludes that ". . . the evidence is sufficiently strong to establish the existence of precognition . . . ."[98]

## Retro-Causal Explanation

But if it is allowed that precognition of future events sometimes occurs, even if unbeknownst to the subject, then it might be argued that the most plausible explanation of this phenomenon is that the future events in question retroactively cause the cognition of them in the subject's mind. Observing that in clairvoyance or telepathy we can say that the subject is responding to or influenced by events he has not observed or inferred, C. W. K. Mundle states that in precognition we can say that the subject is responding to or is influenced by a later event. Thus, precognition involves the notion of causal influence operating from later to earlier.[99]

### Mackie's Objection

Because of this, some philosophers have been led to deny precognition. Mackie, for example, asserts that precognition cannot be of chance events or free decisions because the future events are in such cases undecided; precognition can only be in cases in which the pre-

cognized event has causal antecedents in the present.[100] This is not due to any theory of time on Mackie's part; rather the problem is that Flew's bilking experiment is "fatal" to cases in which the future cause is not fixed.[101] For then the future event could be prevented, and thus its resemblance to the supposed effect must be fortuitous. Unfortunately, such reasoning is fallacious, as we have seen; moreover, the most striking cases of ostensible precognition involve precisely prior knowledge of events dependent on randomizing devices and free agents. Mackie rejoins that such cases, however, "leave us with a choice between some mysterious, hitherto unknown, variety of forward causation and the equally hitherto unknown and even more mysterious possibility of backward causation."[102] Of the two, the former is the lesser evil. Mundle, however, points out that such a value judgement in the absence of some cogent argument against backward causation may not be so obvious.[103] He discusses two ways to avoid interpreting precognition in terms of backward causation. First, one might maintain that the psychic subject has performed an unconscious inference based on premises acquired by non-precognitive ESP. Difficulties at once arise.[104] In order to forecast the future by rational inference, one must have knowledge of both laws or generalizations and singular propositions. While persons can learn particular facts via ESP, however, it goes beyond the evidence to assert that laws or generalizations might be so learned. More than that, however, in many cases the precognized event could not have been predicted by rational inference. Consider one complicated experiment which Soal conducted with Shackleton: an experimenter would draw a card from a bag or bowl of 200 colored cards (40 cards of each of five colors) and show it to the agent through an aperture in the screen. This determined which of five colored cards before him the agent would lift and look at. Shackleton then guessed which card the agent was looking at. In this experiment he scored highly on +2 hits. The critical point to keep in mind is that the cards on which Shackleton was scoring high had not yet been selected at the time of his guesses.[105] Hence, the theory of unconscious inference would appear to be implausible. Secondly, one might maintain that there is a causal connection between the ostensible precognition and the later event such that the precognition causes the event or that both are influenced by some third causal factor. One might assert, for example, that the precognizer actually influences the randomizing device by psychokinesis and the experimenter by telepathy. Mundle grants that while it would be possible to explain the experimental evidence by such a supposition, one does so "only by making very heavy demands on our credulity."[106]

We should have to posit an influence of a person's thought on machines and other people's behavior which far exceeds anything suggested by the experimental evidence for psychokinesis. Since the time of Mundle's article, however, laboratory evidence for psychokinesis has accumulated to such an extent that Mundle now believes that there is unambiguous evidence for psychokinesis even in cases such as Schmidt's.[107] Gauld also acknowledges this, but points out that in cases of spontaneous precognitions, such as dreams, premonitions, and the like, "the idea that the agents bring about the fulfillment of their 'precognitions' by psychokinesis must surely be dismissed as preposterous. It would involve us in saying that such events as the sinking of the Titanic were brought about by the monitory dreams of those who foresaw the disaster."[108] Thus, each of these theories involves making "extravagant assumptions" about men's powers.[109] In the absence of a cogent argument against backward causation, it is therefore not evident that Mackie's rejection of backward causation as an explanation for precognition is the preferable course.

*Mundle's Objection*

Mundle, however, objects to precognition because, he thinks, it entails that the whole of history co-exists, that past, present, and future events are spread out in a fourth dimension: "If we can conceive of the physical world as a four-dimensional manifold, all of whose parts co-exist . . . this removes the apparent contradiction in talking of [precognition of] future events."[110] Mundle's objection to such a B-theory of time is that it is incompatible with freedom of choice. For if something is precognized, then it cannot be changed. Therefore, Mundle prefers to explain away precognition by one of the above two ways than to embrace the deterministic B-theory it entails. Flew, however, retorts that fatalism is no *a priori* objection to precognition: one might as well say that the person who rejects Hell or anyone else who rejects some view for no better reason than that he would not like it to be true is raising an *a priori* objection, offering a reason for saying this uncongenial view involves a logical or metaphysical impossibility.[111] While Flew's point is well-taken with regard to fatalism, one might argue that the rejection of causal determinism is not due merely to distaste but to an intuitively sensed freedom. Defenders of the B-theory, however, have exonerated that theory completely from the charge of determinism.[112] For events, whether past, present, or future, may be entirely undetermined causally and yet still exist in the manner postulated by the B-theory. As Broad nicely puts

it, the future is predeterminate in that future propositions have a determinate truth value, but that does not mean that the future is predetermined. Since only the latter notion involves the idea of causation, "There is not the least inconsistency in saying that a certain event $e$, which happened at $t_1$, was already completely predeterminate at $t$ but was not then completely predetermined."[113] Nor, it must be said, does Mundle provide any good reason to regard the B-theory as fatalistic: for, since we determine the future, it follows from precognition of a future event, not that we cannot prevent the event, but only that we shall not prevent the event.[114] More fundamentally, however, it seems false that precognition entails a B-theory of time at all. As Broad points out, this inference rests on construing precognition on the model of perception: Since one cannot perceive what does not exist, the pre-perceived future events must actually exist.[115] Broad contends, however, that just as memory of past events does not entail their B-theoretical existence, neither does precognition entail the existence of future events in the B-theoretical sense. In fact memory provides a better model of precognition than does perception. One does not perceive future events as they actually exist in the B-theoretical sense; rather the A-theorist could argue that when these events do happen and future things come to exist, then they retroactively cause a prior subject's precognition of them, in a manner analogous to a past event's causing my memory of that event. Hence, no fatalistic argument based on a B-theory of time seems pertinent to the phenomenon of precognition.

## Difficulties in Retro-Causal Explanation

If the objections of Mackie and Mundle, then, are not of any weight, does this mean that in the parapsychological phenomenon of precognition we have compelling evidence for backward causation? It would seem not. In the first place, a facile appeal to backward causation does not suffice to explain anything. Too many thinkers seem to be under the impression that once "backward causation" is invoked, precognition has somehow been adequately accounted for. But this is far from the case, as Gauld points out.[116] For on a physicalistic account, one would have to claim causal influence either by direct spatio-temporal contact of agent and precognized event or by mediated contact between them via an intervening medium. The first is clearly inadequate and seems ruled out in any case with regard to precognition. Gauld considers two possible variants of the second view. (1) The medium of contact has imposed upon it by the

target a pattern which affects the brain of the precognizer, so that he is able to apprehend it. Such an understanding of ESP on the model of sense perception is, however, very implausible. Broad explains what would be involved in clairvoyant perception of the sixth card in a stack:[117] we should have to suppose that the clairvoyant's brain is being stimulated by a kind of emanation from the card in the pack. The top five cards are transparent to this emanation. All the other cards in the deck are emitting emanations of their own, which reach the percipient's brain simultaneously. There must be a difference between the emanations from the card's background and the design which marks its suit. Moreover, we should have to explain how the clairvoyant could know the shape of the marks of the card (even when it is edge-on), their color, or even that he is discerning the sixth card. These difficulties are immeasurably exacerbated if we now imagine that what the agent knows is not which card is sixth in the deck, but, say, which card the experimenter will select from a deck which has not yet even been assembled and shuffled! Even if we suppose, as in the B-theory, that that future event exists, this does nothing to explain the medium whereby such trans-temporal clairvoyance is possible. Gauld notes that similar objections apply to telepathic communication as well: (a) the emanations should not only pass through everything else, but also through the percipient's brain; (b) the sending agent's thoughts must be identifiable with properties of his brain, and if two people are entertaining the same thought their brain states must exhibit the same pattern; (c) no anatomical loci for generating such a pattern are known; (d) it is unexplained how total confusion between all the various emanating brains is to be avoided in the brain of the percipient; and (e) what the percipient knows often greatly exceeds the contents of consciousness which the agent imposes on the medium of contact. Again, these difficulties are multiplied if we are to imagine that the phenomenon in question is trans-temporal telepathy. (2) Alternately, it might be held that upon a patterned medium of contact (as above) there is superimposed a further pattern capable of being decoded to provide information about things other than the immediate source of the patterning. But this alternative falls afoul of virtually all of the above objections, in addition to positing an unconscious encoding and decoding mechanism for which no analogy is known. But if physicalistic accounts fail, mental explanations fare little better in explaining precognition. If Gauld can compare the clairvoyant mind to an amoeba which envelopes the object of consciousness directly, what would the precognisant mind be but a time-traveling amoeba mysteriously advancing to an arbitrary

point in the future and engulfing the object of precognition? Even if this were possible, it would, moreover, still not be backward causation. It is thus difficult, indeed, to see how backward causation is to serve as a ready answer to the problem of precognition.

In the second place, if one does allow ESP, the evidence for precognition itself is not unambiguous. Brier maintains, for example, that Scriven's illustration can be accounted for in terms of other paranormal phenomena for which experimental evidence exists.[118] Telepathy, clairvoyance, and psychokinesis as well as chance could furnish in many or most cases explanations as intelligible as backward causation. The cases of spontaneous precognition might be called into question simply because only successful premonitions are remembered and reported; moreover, these sometimes portray events which are not truly future, since the agent acts on the basis of his premonition to prevent them. Still, as Mundle admits, in the absence of an *a priori* objection to backward causation, that explanation might seem in some cases to be more plausible than other paranormal accounts. Nevertheless, this means, as Broad states, that if there is some *a priori* objection to backward causation, there are other possible explanations of precognition.[119]

In the third place, it has not been sufficiently appreciated, I think, that genuine precognition does not entail backward causation. All the afore-mentioned attempts to explain the phenomenon of precognition in terms of other forms of ESP and chance are really attempts to explain it away; the tacit assumption seems to be that if precognition is authentic, then it can only be accounted for by backward causation.[120] This, however, seems to be a *non sequitur.* It is possible that precognition be genuine and that it be accounted for on some model involving no appeal to backward causation. For example, one could explain precognition on the model of time-traveling consciousness, as mentioned above, or on the model of the Platonic theory of recollection, the subject remembering on certain occasions innate but forgotten knowledge of future events, or on the model of biblical prophecy, men receiving knowledge of future events via divine revelation. My point is not to suggest that such models afford plausible explanations of the experimental evidence for precognition, but rather to make clear that precognition does not entail backward causation.[121] It would therefore be entirely consistent to admit genuine precognition of future events and yet reject an explanatory model of this phenomenon in terms of backward causation. In summary, while striking evidence for precognition exists, precognition as such does not entail the real possibility of backward causation. Still it might be argued that back-

ward causation is the most plausible explanation of the phenomenon of precognition, in the absence of some overriding *a priori* objection to backward causation.

## *Time Travel*

Finally, we may turn to one of the most fascinating and mind-stretching provinces alleged to demonstrate the real possibility of backward causation: time travel. As Dwyer points out, time travel involves backward causation because events in the present are causally efficacious in bringing about events in the past.[122] Therefore, if time travel is really possible, then backward causation is really possible.

## A Word of Caution

Here, however, a word of caution would seem to be in order. Time travel does involve backward causation, but not so much as might at first appear. What the time traveler does once he is in the past, for example, in no way involves backward causation.[123] For since the traveler is himself in the past at that point, anything he affects will be the result of normal causal influences. If he helps the Egyptians to build the pyramids, he does not exercise backward causation in doing so. Of course, it might be said that his advanced knowledge brought back from the future was a partial backwards cause in his aiding the Egyptians, but this would seem more properly to be part of the background conditions for his causal activity, not part of his exercise of efficient causality itself, which is the sort of causality we are interested in. Insofar as he is an efficient cause, he does not operate in the past in a manner any different than a remarkably precocious contemporary. Thus, anything done by the time traveler in the past is not an instance of backward causation. Nor can it be claimed that effects simultaneous with his arrival, for example, the displacement of air molecules in the atmosphere at 3,000 B.C. by the sudden appearance of his spaceship, are instances of backward causation. For the effects in this case are simultaneous with their cause. Therefore, the only instance of backward causation which I discern in time travel is the appearance of the ship itself which is caused by the time traveler's operating certain controls in his machine in the future. Perhaps he sets his chronometer, presses some buttons, and appears in Egypt 5,000 years earlier. In this case alone would one seem to have an ostensible instance of backward causation.

### The Possibility of Time Travel

Is there evidence which indicates that time travel is possible? Scientists and philosophers agree that the sort of time-machine envisioned by H. G. Wells in his popular novel is in fact an impossibility. Since Wells's machine was conceived to move only through time but not space, it would, so to speak, "run into itself" as it traveled both forward and backward in time.[124] Moreover, it seemed to involve the contradiction of traversing, say, one hundred years of time in five minutes of time, since it was sitting in the same place.[125] With the development of relativity theory, however, which posits the traveler's relative motion in space as well as time, time travel re-emerged as a new possibility. In 1949 Kurt Gödel drafted a model universe using Einstein's field equations which was similar to Einstein's in that it was both static and spatially homogeneous; but differed from Einstein's universe in that Gödel assigned a negative value to the cosmological constant $\Lambda$ (which Einstein had introduced into the equations to prevent the model universe from expanding) and posited an absolute, cosmic rotation of matter, so that isotropy was precluded.[126] On Gödel's model, it was not possible to define a cosmic time because the local times of observers which are associated with the mean motion of matter cannot be fitted together into one world time. The most incredible feature of this model was that it permitted the existence of closed, time-like loops, so that by making a round trip on a rocket ship in a sufficiently wide curve, it would be possible for some observer to travel into any region of the past or future and to return. Although the world line of every fundamental particle was open so that no temporal period could recur in the experience of an observer connected with the particle, other closed, time-like lines could exist such that if $P$ and $Q$ are any two points on the world line of a fundamental particle and $P$ precedes $Q$, then a time-like line exists connecting $P$ and $Q$ on which $Q$ precedes $P$. By following these loops an observer could fulfill Wells's dream of time travel. But if such a journey is possible, then so is backward causation.

The question then which confronts us is whether Gödel's model constitutes a mere mathematical curiosity or represents a possible description of the real universe. Unfortunately for time travel buffs, it seems pretty clear that Gödel's universe fails as an actually descriptive account of the universe, so that time travel is not a possibility for us. That is to say, Gödel's universe, even if nomologically possible, is not physically possible.[127] As Whitrow observes, the empirical evidence for world isotropy undercuts the postulate of cosmic rota-

tion and furnishes instead evidence for the existence of cosmic time. The microwave background radiation is remarkable precisely for its isotropy, which varies by less than one part in a thousand. "Consequently, we have strong evidence that the universe as a whole is predominantly homogeneous and isotropic, and this conclusion . . . is a strong argument for the existence of cosmic time."[128] Since these facts are incompatible with Gödel's model, it follows that time travel, at least along his lines, is physically impossible.

## Stock Objections to Time Travel

But the issue remains as to whether time travel and, hence, backward causation are not possible in a broader sense. Here the proponents of time travel have argued persuasively that the stock objections to the possibility of time travel are unsound. For example, Gödel himself was disturbed because he believed that his models make it possible that someone might travel into the past and find a person who would be himself at some earlier period of his life. "Now he could do something to this person which, by his memory, he knows has not happened to him."[129] Similarly, David Lewis muses over the possibility of traveling into the past and killing one's grandfather; he concludes that in the narrow context (the moment in the past) he can kill his grandfather, but that in the wider context (the present as well as the past) he cannot.[130] This objection, however, is once again infected by the fallacious reasoning of fatalism.[131] As Horwich points out, from the fact that someone did not do something, it does not follow that he could not have done it. Hence, Gödel was unnecessarily concerned about my doing something to myself which I could not remember: all that follows from his objection is either that I did not perform the action or that I forgot it. Lewis's case is more complex. From the fact that the time traveler is alive, it follows that he did not in fact kill his grandfather prior to his begetting children. But what sense would it make to assert that he could have killed his grandfather, though he did not in fact do so? For while it makes sense to say, "From the fact that I shall be in Warsaw next year, it follows, not that I cannot commit suicide this year, but only that I do not," it does not seem to make sense to say, "From the fact that I now exist, it follows, not that I cannot kill my grandfather, but only that I do not." In the first case, there are possible worlds in which one commits suicide and fails to be in Warsaw the following year; but in the second case, there are no worlds in which one kills one's ancestor. Killing one's ancestor

entails that one's ancestor was not killed. Hence, the act of killing one's ancestor is inherently unintelligible. Hence, the proposition

12. I killed my ancestor prior to his begetting children

cannot be possibly true. But time travel does not entail that such a proposition should be possibly true. As Dwyer says, any confusion on this point would seem to have its roots in the mistaken belief that a time traveler has it in his power to change the past but is mysteriously prevented from doing so.[132] Thus, it is not time travel which is incoherent, but the act which the time traveler is enjoined to perform. No one need lose sleep over the worry, "What if my son should return from the future and slay me before I have children?" On the other hand, if time travel is possible, he might well be troubled by the fear, "What if my son should return from the future and slay me after I beget him?"

Other traditional problems of time travel are resolved by a correct understanding of the means of traveling into the past. For example, because the time traveler journeys through space as well as time, the problems associated with a Wellsian time machine are circumvented. In his own frame of reference or proper time, the time traveler never experiences time reversal or, indeed, backward causation. For him the sequence of events proceeds quite normally. But when another frame of reference is considered, say, the earth's, then the time traveler's rocket ship appears first in the past and sometime later is constructed and departs on its journey into time. In this way the time traveler can traverse eons of earth time in a relatively short proper time. If he meets himself in the past, no paradox is thereby involved, for in his proper time such a meeting is of the same person at different stages in his life; it is not therefore a case of being in two places at the same time. It might be objected that the future self might tell his past self what choices he shall make in the future, thereby removing his freedom. But this reasoning embodies the old ignorance condition of Dummett, Taylor, and others, which we have rejected. As Horwich explains, the argument would prove at best that one would no longer *feel* free.[133] But even that is to concede too much: it is not clear that decision-making essentially involves ignorance of the future choice. I may, for example, have absolute confidence in a psychologist's prediction that I shall quit smoking and yet feel that I must freely decide to kick the habit. Similarly, I may firmly believe that I shall go to college because my future self displayed his diploma to me and yet feel that it is up to me to decide to go. Thus, many of the usual worries about time travel do not seem to be particularly problematic.

*The Logically Pernicious Self-Inhibitor*

But at this point a more formidable objection to time travel may be lodged: time travel seems to entail the possibility of the existence of a logically pernicious self-inhibitor. The objection is reminiscent of the argument against tachyons. Earman asks us to consider a rocket ship which at some space-time point $x$ can fire a probe which will travel along a time-like loop into the past lobe of $x$'s light cone. Suppose the rocket is programmed to fire the probe unless a safety switch is on and that the safety switch is turned on if and only if the 'return' of the probe is detected by a sensing device with which the rocket is equipped.[134] Is the probe fired or not? The answer is that it is fired if and only if it is not fired, which is logically absurd. Again, this contradiction does not suffice to show that time travel *per se* is impossible. Rather the whole situation is impossible, and this includes assumptions about the programming of the rocket, the safety switch, the sensing device, and so forth. But although the contradiction could be avoided by giving up some of these assumptions, Earman suggests that we have good evidence that rockets can be so programmed. Earman concludes, "Thus, although we cannot exclude closed timelike lines on logical grounds, we do have empirical reasons for believing that they do not exist in our world."[135] His conclusion may be strengthened: it is not just the feasibility in our world of such rockets that generates the paradox; so long as such machines are nomologically possible, the contradiction could arise. Given the nomological possibility of such machines, then, time-like loops must be nomologically impossible if the contradiction is to be avoided. The conclusion would therefore appear to be that although time travel is logically possible, there are no nomologically possible accessible worlds in which time travel can occur.

Horwich has, however, disputed Earman's reasoning, claiming that he invalidly infers that since the various assumptions are logically incompossible and since the rocket, safety switch, and so forth are physically possible, therefore time-like curves do not exist.[136] But there could exist time-like curves in the actual world or in any physically possible world in which the rocket, switch, and so forth do not exist. Letting $p$ = "The rocket, probe, safety switch, and so forth exist and function properly," $q$ = "Time-like loops exist," and $r$ =

"The probe is fired," Horwich's argument appears to be that the following reasoning, which is Earman's, is invalid:

13. $(p \cdot q) \supset (r \equiv \sim r)$          P
14. $\diamond\, p$                              P
15. $q$                               P
16. $(\diamond\, p) \cdot q$                     Adj., 14, 15
17. $(\diamond\, p) \cdot q \supset \diamond\, (r \equiv \sim r)$      13
18. $\diamond\, (r \equiv \sim r)$                 MPP 16, 17
19. $q \supset \diamond\, (r \equiv \sim r)$             CP, 15-18
20. $\sim q$                             RAA

The problem is that premiss (17) does not follow modally from (13). Although the conjunction of $p$ and $q$ implies an absurdity, the conjunction of $q$ with $\diamond\, p$ implies neither a contradiction nor even the possibility of a contradiction. In other words, time-like loops can exist in any world in which such rockets, switches, and so forth are possible but never in fact exist or function correctly.

The opponent of time travel has thus committed precisely the same fallacy as the fatalist, and the response to them has the same form. The opponent of fatalism asserts that from either the antecedent truth of or God's foreknowledge of a future contingent proposition it follows, not that the future event cannot occur but only that it *will* not occur; the proponent of time travel maintains that from the fact that time-like loops exist it follows, not that such rockets *cannot* exist or function properly, but only that they *do* not exist or function properly. Further, the opponent of fatalism maintains that if the contingent event were not to occur, then different propositions *would* have been true and God's foreknowledge *would* have been otherwise; the proponent of time travel contends that if such rockets *were* to be built and function properly, then the time-like loops would not exist. Thus, the two situations seem quite parallel.

Nevertheless, I must confess that while the argument of the opponent of fatalism seems entirely plausible, the same argument in the hands of the proponent of time travel (or, implicitly, of tachyons) runs strongly counter to my intuitions. One might imagine a world, for example, in which all the technology and even the blueprints for the rocket, probe, and so forth exist and in which time-like loops exist. It seems bizarre to claim that while the rocket could be built, so long as no one in fact builds it the loops can exist without even the possibility of a contradiction's arising. Moreover, it seems very strange to claim that were the rocket and so forth to be built, then the time-like loops would not exist. Suppose a team of rocket scientists

took out the blueprints of the devices and decided to build them. What is going to stop them? Horwich's response that to ask such a question is simply to ask why a contradiction does not come true might fail to assuage one's suspicions that something is amiss here. *Something* must prevent the rocket's being built or a contradiction will arise; if the rocket and so forth are constructible, a contradiction would seem to be generable, which is absurd. Or again, we might imagine a world in which the rocket, probe, and so forth do exist and in which time travel occurs regularly. But each attempt to generate the self-inhibiting situation is frustrated by a series of accidents, which prevent the devices from functioning properly. But why do they always go wrong? Or worse, why do things not go wrong whenever the probe travels the same loop when no safety switch is used, but goes awry whenever the switch is employed? Horwich confesses that he does not know the answer, but he believes that there is no reason to think an answer is impossible. This confidence might strike one as a somewhat unwarranted optimism. Finally, we might imagine a world in which time travel along time-like loops is a regular affair and in which the rocket, switch, and so forth not only exist, but would function properly if they were used. But in fact nobody uses them. Indeed, the commander of every time vessel may instruct his new recruits, "Do not activate the probe and the safety switch with the sensing device; otherwise the time-like loops along which we travel would not exist." Obeying his command, the new recruits like the rest of the crew are careful not to activate the devices, lest the loops should not exist. But does the very structure of space and time thus depend on the obedience of callow, young recruits to their commanding officer?

In a more recent discussion of these issues, Horwich attempts to confront such questions more squarely.[137] He now argues that the reason the self-inhibiting attempts never succeed is because they are never tried, since the fuel requirements for time travel into the local past are physically excessive. He begins with the premiss

> 21. If successful self-inhibiting is impossible, then either self-inhibiting attempts are rare or circumstances often conspire to ensure that they do not succeed.

Since successful self-inhibiting is impossible, the consequent of (21) is true. But it is highly improbable that circumstances continually conspire to thwart self-inhibiting. For in order for this to happen there would have to continually be inverse causal forks leading up to the bungled attempts, that is to say, uncorrelated causal antecedents

which unite coincidentally in producing an effect, in this case, the botching of the self-inhibiting experiment. Therefore, it is highly probable that

    22. Self-inhibiting attempts are rare.

But why are they rare? The opponent of time travel might say because the structure of spacetime does not permit time travel, that is, there are no causal loops. But there could be many other reasons why such attempts are not common. Accordingly, Horwich suggests

> 23. If self-inhibiting attempts are not common, then either time loops do not exist, time travelers have no interest in self-inhibiting experiments, or fuel requirements for trips into the local past are excessive.

Now in fact we know that the fuel requirements for such trips are excessive; therefore, this fact serves to explain why self-inhibiting experiments never succeed.

But again, I must confess my disquietude with this response. The technological impossibility of fuel requirements seems a thin barrier, indeed, to place between time travelers and their self-inhibiting experiments. For self-inhibiting situations could be arranged without fuel-powered craft, as we saw in our discussion of the tachyonic anti-telephone. In such a case, we are simply left with the improbable series of coincidences which frustrate all attempts to generate self-inhibiting situations. But secondly, why suppose that one must travel into his local past to generate such situations? Surely self-inhibiting experiments could be devised that would involve travel to the distant past, in which case fuel requirements would not be prohibitive. Thirdly, suppose some new, hitherto undreamed of fuel or alternative to fuel were to be invented that would permit travel into the local past. What then? Horwich admits that there cannot be a physically possible world that contains the conjunction of (i) closed time-like lines, (ii) sufficient fuel for trips to the local past, (iii) inclinations to perform self-inhibiting experiments, and (iv) initial conditions that preclude coincidences which frustrate self-inhibiting experiments. But he maintains that if (ii) were to obtain, then at least one of the other conditions would not. Therefore, one cannot infer that were a new fuel invented in a world in which (i), (iii), and (iv) hold, then all four conditions would hold together.

    Using the same interpretation of the variables $p$ and $q$ as above and understanding "functions properly" to include the fact that the fuel

requirements are met, we may represent the argument of the opponent
of time travel as follows:

24. $q \cdot \diamond p \; \square\!\!\rightarrow (p \; \square\!\!\rightarrow p \cdot q)$ \qquad P
25. $\sim \diamond (p \; \square\!\!\rightarrow p \cdot q)$ \qquad P
26. $\sim \diamond (q \cdot \diamond p)$ \qquad MT 24, 25
27. $\square (\sim\! q \vee \sim\!\diamond p)$ \qquad DL 26
28. $\diamond p$ \qquad P
29. $\sim\! q$ \qquad TT 27, 28

This reasoning yields the desired conclusion that since p is possible,
it must be the case that the time-like loops do not exist.

The question at issue is the truth of (24). Horwich disputes its
truth because in his judgement, if we had a world in which time loops
existed and a combination of conditions were possible consisting of the
rocket with sufficient fuel, self-inhibiting inclinations on the part of
time travelers, and initial conditions of the universe which preclude
coincidental botching of the experiments, then the closest world in
which these conditions were realized would be a world without time
loops. He asserts that the *de facto* conditions in a world with closed
time-like curves will be much more constrained than in open time
worlds and so "we should not be surprised that a hypothetical change
in them—such as the supposition of more fuel or better technology—
could require a difference of spacetime structure or the sort of initial
conditions that will give rise to certain types of coincidence."[138]

But now it seems that we are merely back where we started from:
were the experiments to be tried, the time loops would not exist or the
experiments would be coincidentally frustrated. On the other hand,
(24) seems to have some intuitive plausibility. Horwich's denial of
(24) appears to depend at any point in time upon a special resolu-
tion of vagueness that permits back-tracking counterfactuals, that is,
counterfactuals in which the truth of the antecedent implies some ad-
justment of the past. In such a case the closest possible worlds to the
actual world are not those in which the past is preserved inviolate, but
in which some feature of the past is other than in the actual world
in order that some overriding feature of the actual world might be
preserved as much as possible. It is a highly disputed question as to
when a special resolution of vagueness between worlds is warranted.
It seems to me, however, that a special resolution is in order when-
ever a relation of conditionship obtains between the state of affairs
described in the antecedent of the counterfactual and that described
in the consequent. Where this is lacking, the burden of proof would
seem to lie on him who maintains that a special resolution is to be

employed rather than the standard resolution of vagueness. Hence, for example, it seems true that

> 25. If it were the case that Lincoln was assassinated and I can possibly eat ice cream, then were I to do so, it would be the case that Lincoln was assassinated and I eat ice cream.

Here Lincoln's death and my eating ice cream are totally unrelated, so that whether or not I eat does not affect Lincoln's death. Analogously, the construction and proper functioning of the rocket have no effect upon the structure of space-time. Hence, if the time-like loops exist and the rocket and so forth are possible, then it seems that it would be true that if the rocket were to exist, both the loops and the rocket would exist, which results in a self-inhibiting situation. But since it is impossible that were the rocket to exist and function properly, then both it and the time-loops would exist, it follows that it must be impossible for the time-loops to exist and the rocket to be possible. Since the rocket is possible, necessarily the time-loops do not exist. (For the same reason, a tachyonic anti-telephone cannot exist.)

If this defense of (24) is correct, then time travel is impossible. But notice two interesting differences between time travel and divine foreknowledge: (i) The reason self-inhibiting situations do not occur with regard to divine foreknowledge is not due to improbable sets of coincidences, but simply because God foreknows and can thus make allowance for any human attempts to generate such situations. Because the human persons are dealing, not with a passive state of nature, but with an intentional agent who adjusts in advance for their own free decisions and actions, He cannot be induced into a self-inhibiting situation. In this sense, the case of divine foreknowledge is more analogous to the case of Newcomb's Paradox (chap. X) than time travel. (ii) Since God's foreknowledge of future events is counterfactually related to those events as consequence to condition, the case of His foreknowledge is disanalogous to the case of closed time-like curves, which are not dependent upon the choices of time-travelers. This is the crucial reason why a proposition of the form of (24) seems appropriate in the time travel case, but not in the case of divine foreknowledge.

If Horwich is right, however, in rejecting (24), then we are left with the situation that a past reality would not exist were some future reality to be realized, despite the absence of any relation of conditionship between them. Our inquietude at this situation can, however, be considerably diminished by recalling our earlier discussion of "within one's power." There we saw that power is not only not closed under

entailment, but also not even under logical equivalence, if a relation of conditionship is lacking.[139] Hence, even though it is true that

> 30. The rocket, probe, safety switch, etc. function properly $\equiv$ Time loops do not exist

and even if space cadet Jones has it in his power to bring it about that the first half of this equivalence is true, it does not follow that he has it within his power to determine the structure of space and time. All that follows is that Jones exercises his above power in worlds in which there are no time loops and that in worlds in which loops exist Jones never exercises his power. There is a sort of logical parallelism here without any relation of conditionship, so that rejection of the self-inhibitor argument does not imply embracing counter-intuitive notions of power. This scenario is even more friendly to the compatibility of divine foreknowledge and human freedom than the view predicated on the truth of (24), since this compatibility would exist even in the absence of a relation of conditionship.

## Circular Causation

Even if the objection based on the logically pernicious self-inhibitor is deemed to fail, however, there is, I think, a further telling objection to time travel which does not rely on purely logical considerations. Consider a case in which the time traveler confronts his younger self in the past. Suppose further that the younger self receives from his older self the information on how to build the time machine and that this is his only source of this information. In such a case the older self knows how to build the time machine because he had been told when he was young how to do it. Thus, the older self gets the information from the younger self and the younger self gets it from the older self. While there is no logical contradiction involved in such a state of affairs, surely this sort of circular causation is ontologically or metaphysically impossible.[140] A source of information outside the loop would seem to be necessary. David Lewis's rejoinder to this difficulty is faltering: where, he asks, does the information come from?—there is no answer, he responds. But if God or the Big Bang or the decay of a tritium atom are uncaused and inexplicable, why can't inexplicable time loops be possible?[141] But none of these supposed parallels involve circular causation or conveyance of information. (And whether all of these are uncaused or inexplicable is itself a moot point.[142]) This is not to say that all instances of circular causation are impossible,[143] but in this case it certainly seems to be. Inasmuch as the possibility of time travel seems to entail the possibility of such a circular communication

of information—since it does not involve changing the past and since the envisioned meeting could no doubt occur—, it seems that time travel is really impossible.

In summary, then, having examined the evidence for backward causation in such various fields as neurology, sub-atomic physics, electrodynamics, parapsychology, astrophysics, and time travel, we have seen that the evidence is at best equivocal. There are no good grounds therefore for thinking that backward causation, even if logically possible, ever occurs or is even really possible.


## PART III: THE METAPHYSICAL IMPOSSIBILITY
## OF RETRO-CAUSATION

### The A-theory and Backward Causation

But is there any warrant for thinking that backward causation is really or ontologically impossible, apart from the objections that might be leveled against particular sorts of retrocausal relations? The answer to this question seems to rest upon one's theory of time.[144] It is probably no coincidence that virtually all of the proponents of backward causation presuppose or explicitly defend a B-theory of time. Graham Nerlich, for example, flatly states that the argument for backward causation presupposes that time is a sum of regions among which the present is ontically on a par with all the others. If this is not the case, he states, then there are no causal relations across regions of time and the argument fails. Thus, "Making things to have happened is a package deal with the regional view of time . . . ."[145] In the specific alleged cases of backward causation, we find this same presupposition. Costa de Beauregard points out that the "four dimensional extended space-time" interpretation of Minkowski pervades Feynman's 1949 papers, which include his reinterpretation of particle pair creation/annihilation in terms of time-travailing electrons.[146] For Feynman causality is conceived in terms of 4-dimensional space-time connections which are invariant on reversals of space or time. Earman, who defended backward causation in classical electrodynamics, denies that causation has a directionality that is grounded in objective physical features of the world and asserts that the metaphor of the "flow" of events from the past into the future is without any hard, philosophical cash value.[147] In defending backward causation as an explanation of precognition, Brier advocates taking time as a fourth dimension of space, so that what the precognizer perceives

are existent future objects: "We think that yesterday is gone and tomorrow is not yet, but they may both exist now, in the fourth dimension of space."[148] Bilaniuk and Sudarshan's invocation of the Reinterpretation Principle to account for negative energy tachyons moving backward in time presupposed, as we saw, that a tachyon's world line simply exists tenselessly in space-time. Proponents of time travel are especially explicit in their espousal of the B-theory. Quoting Alexander, Weyl, and others, Dwyer asserts that ". . . all phenomena exist in a four dimensional world known as spacetime . . . The world line of the time traveler and his rocket lie (tenselessly) in space-time . . . we must resist the tendency to think that between 3,000 B.C. and 1978 the fact of the time traveler's arrival in ancient Egypt and his pyramid building activities are in some sense 'harder' facts than his subsequent construction of a rocket and successful take-off in 1978."[149] Similarly David Lewis declares,

> The world—the time traveler's world, or ours—is a four-dimensional manifold of events. Time is one dimension of the four, like the spatial dimensions . . . Enduring things are timelike streaks: wholes composed of temporal parts, or stages, located at various times and places. Change is qualitative difference between different stages—different temporal parts—just as a 'change' of scenery from east to west is a qualitative difference between the eastern and western spatial parts of the landscape.[150]

According to Paul Horwich, McTaggart's argument that the A-series is self-contradictory "should not persuade us that time is unreal but, rather, should force us to acknowledge that time does not require 'genuine change' after all;" "'now' is an indexical expression, like 'here,' so there is no metaphysical significance in the variable location of its referent."[151]

It is, as I say, no coincidence that proponents of backward causation unanimously presuppose the view of time just described. For if future things exist and future events are on an ontological par with events of the present, then they can more readily be conceived to be the causes of some of those present events. Since the difference between past, present, and future consists entirely in the subjective apprehension of consciousness, one might well imagine a later, "future" event to be the cause of an earlier, "past" event.[152]

To the A-theorist, on the other hand, backward causation would seem to be ontologically impossible. Since the objects of the future are non-existent and its events have yet to occur, since the edge of becoming is real and not merely mind-dependent, since sequence is essential to the nature of time itself and the number of actual events increases with time as new states of affairs are progressively instantiated, to

assert that backward causation could occur is to claim that something can come from nothing. For at the time of the effect the cause quite simply does not exist. An effect which appears in the temporal sequence of events which is supposedly produced by some future, yet to be realized cause therefore comes into being from nothing. And this, the A-theorist rightly maintains, is ontologically impossible.

It might be rejoined that on the A-theory neither does the past exist, and yet past events are held to be causes of present events. But if non-existent past events may cause present events, why could not non-existent future events do the same? It would be unavailing, it might be added, to claim that past events are different from future events because only past events have actually occurred, for this is a mere tautology. By the same token only future events will actually occur. But if no longer existent events are able to have present effects, then so also should not yet existent events.

In response to such a rejoinder, the A-theorist would, I think, want to maintain that there is indeed a difference between the past and the future which is not merely tautological and which accounts for the exclusively forward direction of causation. According to the A-theory, the past is actual in a way the future is not: the past is actualized while the future is merely potential. Perhaps the best way to explain the difference between the two would be that on the A-theorist's understanding of the Special Theory of Relativity, cosmically past and present events having for two local observers in relatively moving inertial frames a space-like separation can be experienced by those observers in different chronological order due to the relativity of simultaneity, whereas no cosmically future event can be so experienced (see Appendix I). When it is remembered that the relativity of simultaneity depends on the reception of light rays reflected by some object, we can see that this difference between the past and the future amounts to saying that while there exist traces of past events (reflected light rays) there cannot exist any traces of future events, which are purely potential.[153] Indeed it is these traces of all kinds that result in the exclusively forward direction of causal processes. For the no longer existent past event does not act at a temporal distance to immediately produce some later effect, but it sets in action a causal series in which each member produces its effect simultaneously and each effect continues as a trace of its predecessor to bring about further effects. Backward causation is impossible, as Sarah Waterlow points out in an insightful but much neglected piece, because of the impossibility of backward continuing in time.[154] She explains that the event designated "cause" begins before the event designated

"effect" and then continues up to and during the time during which the effect itself occurs. If temporal continuing is only from earlier to later (A-theory), then there can be no backward continuing and, hence, no backward causation. On the other hand, if continuing is no more than temporal extension (B-theory), then continuing is not inherently directional, and on this account, she opines, backward causation does not even seem mysterious. Backward continuing cannot be pronounced impossible on purely logical grounds anymore than backward causation, but she claims that we can make no sense of it because it is unimaginable and indescribable. It seems to me, therefore, that the A-theorist is entirely justified in his rejection of the possibility of backward causation. Backward causation would require that non-existent future events bring about other equally unreal future events which, instead of continuing to exist forwards, continue to exist backwards until they bring about the present event, which alone has reality—an account which, indeed, seems unintelligible.

### Superiority of the A-theory

The question which therefore now arises is whether there are any good reasons to regard the A-theory of time as preferable to the B-theory. It seems to me that there are. I hope to explore this issue more fully in a future project on the coherence of divine eternity, but a few cursory remarks may here be made. The A-theory captures more adequately our fundamental intuitions about the sequential nature of time, whereas the B-theory is a distortion guilty of spatializing time. As Whitrow urges, the very essence of time is its transience; this is a fundamental concept obscured by the B-theory.[155] B-theorists will, of course, retort that temporal becoming is merely mind-dependent, not an objective feature of the world. This contention is, however, problematic and implausible. To mention but one consideration: let us imagine a world in which there exist no physical objects at all, but only disembodied minds, say, angels. In such a world the only events which occur would be mental events in the succession of the contents of consciousness of each mind. Now the relations of past, present, and future which obtain between the thoughts of such minds are either real and objective or they are not. If they are real and objective, it follows that temporal becoming is not illusory, since one thought actually occurs after another, and as yet future cognitions simply do not exist. It would therefore be an inadequate account of temporal transience to characterize it as merely mind-dependent, since the contents of consciousness are themselves temporally ordered. Suppose, on the

other hand, that one asserts that all the mental events whether past, present, or future in a stream of consciousness are equally real. Whatever else might be said about the intelligibility of this suggestion, the salient point is that it then becomes impossible to explain why a B-series of events appears to consciousness as an A-series, that is to say, no account of the appearance of becoming can be given in terms of mind-dependence since the contents of consciousness are themselves strung out along a B-series. If it be objected that the supposition of a world wholly comprised of disembodied minds is impossible, one may respond, first, that such a world is logically possible and, second, that the objection would then make one's theory of time system-dependent upon one's theory of mind, which seems a rather dubious procedure. The conclusion seems to be that it is futile to attempt to account for temporal becoming by appeal to consciousness of events as past, present, or future because the succession of contents of consciousness implies itself a real transition of time or else it cannot serve to account for the experience of temporal sequence.

If then the A-theory of time is preferable to the B-theory, as I have suggested, it follows from our discussion that backward causation is ontologically impossible because it would violate the nature of reality itself. This constitutes a bar to the validity of a retrocausal interpretation of the phenomena which we have considered in our discussion of positive evidence for backward causation.

### Application to Purported Instances of Backward Causation

In the field of parapsychology, for example, C. D. Broad and C. W. K. Mundle rightly objected to the retrocausal explanation of precognition on the basis of their rejection of the B-theory of time.[156] Broad saw even more clearly than Mundle that there are distinct epistemological and ontological objections to precognition, one of which fails and the other of which is more serious. Epistemologically no sound objection can be raised against precognition on the grounds that the precognized object does not yet exist. This objection rests on the assumptions that (1) precognition is epistemologically of the nature of perception, so that it is quite literally pre-perception, and (2) an ordinary perception is a state of direct acquaintance with the perceived object. Broad rejects both assumptions. Against (1), he counters that such a model would also preclude memory, which is not regarded as post-perception. Against (2), he argues that we have in some cases perceptions of events which have ceased, such as hearing a gunshot a mile away. While Broad's second point is not convincing,[157] his first

seems quite correct. As he puts it, ". . . it is very doubtful whether any precognitive experience is *literally* a pre-perception of the event or state of affairs which will in due course fulfill it. And precognition, insofar as it is not literally of the nature of perception, is *epistemologically* on all fours with ordinary non-inferential retro-cognition, which admittedly presents no particular epistemological difficulty."[158]

By contrast, the causal objection Broad deems truly serious. In post-perception there is a causal chain initiated by the event perceived and leading up to the event of post-perception. But in precognition there can be no analogy to this. Broad, originally a B-theorist who came to adopt the A-theory of time, maintains that with regard to a pre-referential cognition it is plainly nonsensical to say the fulfilling event sets up a chain of effects and causes which results in the pre-referential experience. For until the event happens, nothing can be caused by it, since the future event *is* nothing but an unrealized possibility until it comes to pass. Broad emphasizes that it is a mistake to take some present event and look back into the past to discern its effect. This gives the impression that cause and effect are both actual. Rather we ought to begin with some present event and look forward into the future for its cause. But when we do this, it becomes clear that "future event" does not describe an event of some kind—that would be to commit McTaggart's error of imagining some event down the line which will become present. A future event is merely an unactualized possibility which will become actual. As such it cannot be the cause of a present precognitive event. Broad's analysis is quite correct on this score, though, as we have seen, he was incorrect to argue that precognition cannot therefore be genuine.

Although Brier rejects Broad and Mundle's reasoning as question-begging, it seems to me that he has failed to appreciate the force of the objection, given the A-theory of time. His conclusion that Mundle has not shown it to be "logically impossible for a cause to come after its effects"[159] shows that he has failed to grasp the objection, since it does not concern logical impossibility. Indeed, Brier gives away his case when in a later article he commends the four-dimensional manifold view of space-time and even recommends taking time as a fourth dimension of space in order to explain precognition. He contends that a two-dimensional creature would say, as a three-dimensional object is lowered through his plane, that the earlier sections of the object do not exist anymore, that they are in the past. But, says Brier, they are not in the past; they are in the third dimension. If a two-dimensional being could look up and see the third dimension, he would be seeing the future. Similarly, "We think that yesterday

is gone and tomorrow is not yet, but they may both exist now, in the fourth dimension of space."[160] Brier's discussion seems utterly confused. As the three-dimensional object is lowered through the plane, the event of earlier sections' intersecting the plane is indeed in the past, for the lowering of the object takes time. Thus, time is not eliminated. Similarly, if we were to see an object appear and disappear, it could still exist in some spatial fourth dimension, but time has not been eliminated. Furthermore, a two-dimensional being looking up into the third dimension does not see the future, for the object could be withdrawn again. Temporal becoming, therefore, has not been eliminated. What Brier is really advocating is a B-theory of time as an explanation for precognition on the model of perception, which is precisely what Broad and Mundle rejected. It is Brier therefore who begs the question. Given the A-theory of time, retrocausal accounts of precognition seem to be precluded.

Similarly, with regard to tachyons and time travel, whatever one may think of the self-inhibitor arguments, it seems clear that our metaphysical objection, if cogent, would preclude the existence of particles or machines traveling backward in time. Given the A-theory of time, objects do not exist as timeless world lines in which earlier and later sections are equally existent. Rather temporal becoming is real, and relations of past, present, and future are fundamental. Future events, such as the firing of a negative energy tachyon signal, and future objects, such as a time machine, are simply unreal. Therefore, present events, such as the reception of such a signal or the appearance of the time machine, cannot be caused by them. The B-theory of time is essential for the possibility of such temporally inverted causal relations.

## Conclusion

In summary, we have seen that while the standard objections aimed at demonstrating the logical impossibility of backward causation fail, there are nevertheless good reasons to doubt the real possibility of retrocausation. There is no unequivocal evidence supporting either the presence or even possibility of backward causation, and there is good reason to reject its real possibility on the basis of the nature of time. Backward causation would appear to entail a B-theory of time, but it seems doubtful that that theory captures the essence of time without distortion. Since on the A-theory of time backward causation would appear to involve something's being produced by nothing, it follows that backward causation is ontologically or metaphysically im-

possible. That means that the proposition "An effect cannot precede its cause" expresses a synthetic *a priori* truth, that is, a proposition true in all ontologically possible worlds.

In conclusion, we have seen that the fatalist's final bid to preserve his mistaken notion of "within one's power" by appealing to the necessity of the past rests on fundamental confusions. A distinction must be drawn between *changing* the past or future and *causing* the past or future. It is logically impossible to change either the past or the future. This is not fatalistic, however, because we have the power to cause future events and so determine the future. By contrast, we do not possess the ability to cause past events and so bring about the past. It is this causal asymmetry between the past and future that accounts for our intuitions of the necessity of the past, which is exploited by the fatalist, and of the openness of the future. Thus, one may quite consistently hold that it is within one's power to act other than as he will in fact act without embracing an analogous power to either change or causally determine the past.

# "WITHIN ONE'S POWER" ONCE MORE

## *Power and Counterfactual Openness*

We have seen, then, that the fatalist presupposes a defective notion of "within one's power." In the final analysis, fatalism consists merely in the logical impossibility of performing both of two logically incompatible acts. To label this impossibility "fatalism" is misguided, since one's supposed inability to bring about logically incompatible states of affairs is not properly a matter of ability or power at all. If some future contingent proposition $p$ concerning one's free action is true, then to say that one cannot bring it about that some proposition $q$ which entails $\sim p$ is true is merely to say that a *necessitas consequentiae* holds; the "cannot" has nothing to do with ability. Moreover, a proper understanding of conditionship discloses that one's own appropriate future free act is the condition of $p$'s truth value, not *vice versa*, so that the reason $p$ is true is because one will decide to do what is described in $p$. Thus, so long as one's free act is logically prior to the truth value of propositions about it, the chronological priority of the propositions' being true or being truly asserted is irrelevant to the issue of what is within one's power.

What, then, does it mean to assert that acts which one does not in fact perform are nevertheless "within one's power"? Very simply, assuming that I am causally free, it seems to me that to claim that some non-actual action is "within one's power" is to assert the truth of a counterfactual such as:

　　1. I could do some action $a$, if I wanted to.

Suppose, furthermore, that it is true that

　　2. Were I to do $a$, then some consequence $c$ would obtain.

From the fact that $c$ will not obtain, therefore, it would be fallacious to conclude that it is not within my power to perform $a$. It follows from the fact that $c$ will not obtain only that I do not perform $a$, not that I could not perform $a$. But if I could perform $a$, then $a$ is within my power. The factors relevant to whether I could perform $a$ are the antecedent and contemporary causal conditions bearing on my decision to perform or refrain from $a$. What is not relevant is the truth value of future contingent propositions pertinent to $a$. The

truth value of such propositions is a consequence, not a condition, of what I do with regard to *a* and so reflects in no wise upon what lies within my power.

This is not to say that I have the power to change the future; rather it is to say that I have the power to act in such a way that the future would be different were I to act in that way. When addressing the question of whether it is within one's power to prevent some future event, it is important to keep clear the distinction between the *sensus divisus* and the *sensus compositus*. *In sensu composito* I cannot prevent a future event, for this is self-contradictory. But *in sensu diviso* I can prevent some future event, for I have contra-causal power to bring about future events. Similarly it is not within one's power to postvent a past event *in sensu composito* because this is self-contradictory. Since backward causation is metaphysically impossible, we do not generally have it within our power to affect the past even *in sensu diviso*, thus generating our intuitions of the unalterability of the past as over against the future. But where what is past is conditioned by what is future (for example, future contingent propositions' being antecedently true), I have the power to act in such a way that the past would have been different than it in fact was. In this case the relevant counterfactual would be

3. Were I to do *a*, then some consequence c would have obtained.

Again this is not the power to change the past, but the power to act in such a way that were I to act in that way the past would have been different. Thus, if it was true 10,000 years ago that

4. I shall do *a*,

my power to refrain from *a* does not imply that I have the power to change the past so as to make it the case that (4), having been true 10,000 years ago, was false 10,000 years ago. Rather my power to refrain from *a* implies that I could act such that if I were to do so, then (4) would have been false at that time. Clearly no backward causation holds in such a case, since the semantic relation between a proposition and its corresponding state of affairs is non-causal. The future contingent proposition was true because I was going to perform *a*, and if I were not going to perform *a* then (4) would have been false. If I am not causally determined to perform *a*, then it is within my power to determine by my action whether (4) was true or false 10,000 years ago. This sort of power over the past seems pretty trivial, except, as we shall see, when divine foreknowledge comes into play.

### Failure of Fatalism

Historically, fatalists have not, by and large, sufficiently appreciated the counterfactual analysis of "within one's power"—hence, for example, their preoccupation with the problem of changing the past or the future. Taylor in his seminal piece "I Can" discusses counterfactuals under the rubric of hypothetical possibility and seriously misconstrues them.[1] As a result, he is led to adopt an analysis of "I Can" in terms of causal contingency and the purportedly unanalyzable notion "within one's power," with the consequence, as we have seen, that if I decide irrevocably to move my finger depending on the spin of a roulette wheel, then I cannot move my finger until the wheel stops. What Taylor should have said was that I can move my finger while the wheel is spinning because it is true that

    5. If I wanted to, I could move my finger

even though I do not in fact want to. Instead, Taylor lands himself in implicit fatalism which emerges in his later articles. His fifth presupposition in his fatalistic argument, that no agent can perform an act if a necessary condition for the performance of that act is lacking, is based on a misunderstanding of "within one's power." In defense of his fifth presupposition, Taylor writes, "To deny this would be equivalent . . . to saying that I can do something now which is . . . sufficient for . . . the occurrence of something else in the future, without getting that future occurrence as a result."[2] But the denial of (Presupp. 5) does not seem equivalent to such a statement; rather the denial means that (i) were I to do something now which is sufficient for something else in the future, then that future occurrence *would* take place and that (ii) I *could* do that something now though I in fact shall not.[3] Future so-called necessary conditions are irrelevant to what is within one's power now because these "conditions" are in reality consequences counterfactually dependent upon actions taken in the present.

Taylor's misconceptions were taken up into theological fatalism by Nelson Pike. His insistence that it is an *a priori* truth that no action can be performed which would *alter* the fact that someone held a belief in the past or existed in the past reveals that he is thinking in terms of changing the past.[4] In his original piece, at least, Pike does not seem to understand that the defender of foreknowledge is claiming that were one to act otherwise, God would have foreknown otherwise, not that God's belief would be changed. Oddly enough, he admits that ". . . God would have known the opposite if the opposite was [sic] to happen,"[5] but he objects to this on the grounds that God

cannot foreknow freely chosen future decisions—a consideration which is irrelevant to the cogency of theological fatalism. Even in his later work, Pike did not seem to have straightened out the counterfactual nature of the problem. When Saunders argued against him that one has the power so to act that future situations would be other than they in fact are and that earlier situations would have been other than they in fact are, Pike— despite Saunders's clear statement that "Of course we do not so act that either past or future situations are other than they are: but it does not follow from this that we lack the power so to act that they would be other than they are"[6]—rejoins that Saunders may be suggesting that one has the power so to act that a belief held at an earlier time was not held at that earlier time.[7] Saunders's actual point was, of course, counterfactual in nature: I have the power so to act that, were I to do so, a belief held at an earlier time *would not have been* held at that earlier time.

## Conclusion

Once this counterfactual analysis of the way in which non-actual events are "within one's power" is grasped, the heart of fatalism is removed. We have seen that it is logically impossible to change either the future or the past. Nonetheless we can causally determine the course of future events. We cannot in a similar way causally determine the course of past events. But assuming that our actions are not causally determined, we have the ability to act in ways other than we in fact act and were we to act in these other ways, then states of reality conditional upon those acts would be different than they in fact are. The chronological precedence or subsequence of those states with regard to the action is irrelevant. From the fact that certain states are already actual it necessarily follows that the actions of which they are the consequence will be actual, but it does not follow that the actions could not fail to be actual. From the fact that their consequences are actual, we know that the actions will be actual, for were they not to be actual, different consequences would have obtained. It still lies within our power to perform different actions and so to determine past states of affairs which are consequences of those actions. I should argue that it is, therefore, within our power to affect non-causally those past states of affairs, but this further conclusion is not necessary to defeat fatalism. So long as we can act such that, were we to act in that way, the past would have been different, no threat to human freedom can raise its head.

# TRANSITION TO THEOLOGICAL FATALISM

After this lengthy excursus into the problem of logical fatalism, we at last return to the focus of our concern, the problem of theological fatalism, equipped with the materials for a resolution of that issue. As in the case of Zeno's arguments against motion, so in the case of theological fatalism, we know from the outset that, however ingenious the supporting arguments may be, the reasoning must be somewhere fallacious because the conclusion is so obviously wrong. For no theological fatalist has ever managed to make intelligible how it is that God's merely knowing in advance the occurrence of a causally contingent event should somehow constrain that event to occur as it will and not otherwise. If we imagine two worlds $W$ and $W^*$ which both possess the same history of causally contingent events, but that in $W$ God foreknows the sequence of events whereas in $W^*$ God does not, how, we may ask, are the events in $W$ constrained to occur in any way that those in $W^*$ are not, such that the events in $W$ are not free or contingent but the same events in $W^*$ are? In other words, what difference does God's foreknowing future events make, since whether He foreknows them or not the same events would nonetheless contingently occur? Should the theological fatalist respond that God's foreknowing future events entails that propositions about those events are antecedently true or false, but that in the absence of God's foreknowledge such propositions need no longer be regarded as antecedently true or false, then the reduction of theological to logical fatalism has become explicit, and the same considerations that undermine logical fatalism serve to expose the fallacy of theological fatalism as well. Fatalism, then, whether logical or theological seems unintelligible, since it posits a constraint on admittedly causally contingent events which remains altogether mysterious. The task at hand then is simply finding the fallacy in the engaging argument for an obviously false conclusion.

Let us turn therefore to a specific examination of the arguments of our sample theological fatalists, Prior and Pike, drawing upon the insights we have garnered in our discussion of logical fatalism.

## Prior

Prior's argument for theological fatalism hinges on the necessity of the past and, hence, of God's foreknowledge. He emphasizes that

opponents of foreknowledge are usually "perfectly aware" of the distinction between *necessitas consequentiae* and *necessitas consequentis* and that his argument eludes the fallacy of confusing the two because in the proposition

> 1. If anything is (already) known to God, then that thing will be

the antecedent is necessary.[1] It is necessary because it is past and the past cannot be changed: what has been cannot now not have been. Therefore, the consequent of (1) is also necessary.

Now I plan to look at the issue of temporal necessity more closely in the next chapter, but some passing remarks based on our analysis in the foregoing sections would seem to be in order at this juncture. Prior's analysis of the necessity of the past fails to distinguish clearly between changing the past and causally determining the past. He repeatedly slips into speaking of the necessity of the past in terms of unalterability: "For what is the case already has by that very fact passed out of the realm of alternative possibilities into the realm of what cannot be altered."[2] But we have seen that it is logically impossible to change either the past or the future. It is logically true that what has been cannot now not have been, for that is equivalent to the assertion that at the time of utterance, necessarily, what has been has been. Similarly, necessarily, what will be will be. Oddly enough, Prior seems to realize this, for he declares that since ". . . the future is precisely whatever it is that does come to pass after our alleged alteration has taken place, . . . what we alter isn't the future after all, and the real future can no more be altered than the past can."[3] His failure to apply the same reasoning to the necessity of the past is probably the result of his misconstruing the causal isolation of the past in terms of some sort of necessity. This "necessity" is therefore innocuous, and Prior's fatalistic conclusion

> 2. $CFpLFp$

is utterly trivial, meaning only something like

> 3. If some event e will take place, then unalterably *e* will take place.

For (3) expresses only the logical truth that the future is unalterable. If the modal operator is intended to express more than this, then there is simply no reason to accept Prior's initial premiss

> 4. $CPmpLPmp$,

which asserts that if it was the case *m* time units ago that *p* (say, "God foreknows *x*"), then necessarily it was the case *m* time units ago that *p*. For Prior has not shown that the past is necessary other than in the

trivial sense; indeed, I have argued that our intuitions of the necessity of the past are really generated by the ontological impossibility of backward causation. Prior also appears to conflate logical and causal categories in his argument for universal predetermination, for in the conclusion of that argument

    5. $CTaFnpDaFnp$

Da should be taken to mean, not "determined at date $a$," but "determinate at date $a$." The former phrase smacks of causal determinism, whereas the latter connotes only logical determinacy and yields a conclusion which is wholly compatible with human freedom and future contingency. Prior, then, has failed to establish that the antecedent of (1) is necessary, and his argument therefore does commit the modal fallacy of confusing *necessitas consequentiae* with *necessitas consequentis*.

As for Prior's own proposed solutions, we have seen that there are no good reasons for denying that the Principle of Bivalence holds for future contingent propositions, that on the contrary there are good reasons for believing that it does hold for these, that denials of Bivalence for such propositions lead to counter-intuitive consequences, and that the Principle of Bivalence with regard to truth values holds in general. Prior's rejection of Bivalence for future contingent propositions seems to have been based on a misunderstanding of truth as correspondence. As a committed A-theorist, he did not regard future events as actual or real, and apparently concluded that there was therefore no reality for future contingent propositions to correspond with so as to be true or false. Thus, he asserts that with regard to future free decisions there is a "gap in the facts."[4] It is not yet the case that I shall do $x$ or not do $x$; my decision is needed to make one of these the case. Elsewhere Prior asserts that what is not yet determined cannot be a matter of present fact, by which the truth or falsehood of a proposition uttered now can be measured.[5] In this regard, he seems to be confused. My decision is certainly necessary in order for

    6. It will be the case that I do $x$

to be true or false, but that decision need not (indeed, cannot, if [6] is true) be made in the present. The present fact which (6) expresses is the fact that I shall do $x$. There is, then, no gap in the facts: what my future decision will be supplies the truth conditions for what now will be the case. Simply put, future facts render future-tense propositions true or false and determine present facts about what will be the case. The A-theorist is therefore by no means obligated to

embrace Prior's position, which leads, as we have seen, to the counter-intuitive consequence that (6) is false even when I do eventually do $x$.

Finally, as to Prior's critique of the Ockhamist solution to theological fatalism, his admission of the intelligibility of the antecedent truth of future contingent propositions seriously compromises his case, for now his objection reduces simply to the claim that *knowledge* of future contingent propositions is impossible. This claim shall be taken up in the sequel, but for now we may note merely that this is an issue distinct from theological fatalism, which maintains that if God does know the truth values of such propositions, then everything happens necessarily. On this score, Prior has little more to contribute.[6]

### Pike

Nelson Pike's development of theological fatalism is a mare's nest of confusion. He conflates the conceptions of "voluntary" and "free," so that because Jones does not have the ability to do other than he does, his action is not voluntary.[7] This is clearly wrong, and the question is not whether Jones's action was voluntary, but whether it was free in the indeterminist sense. Pike also adopts without explanation or critique Taylor's analysis of ability in terms of "within one's power"— an expression which masks a multitude of misconceptions, as we have seen. His discussion of *necessitas consequentiae* and *necessitas consequentis* concludes that because "God believed Jones would do $x$" entails the truth, though admittedly not the necessity of "Jones did $x$", it is contingently true that "Jones was not able to refrain from $x$"[8]—a conclusion that is, as Hume would say, "admirable." Pike also confuses the counterfactual dependence of God's foreknowledge on future events with altering the past. Thus, he interprets

> 7. Jones had the power to do something that would have brought it about that God believed otherwise than He did 80 years ago

and

> 8. It was within Jones's power at $T_2$ so to act that Yahweh did not believe as He did at $T_1$

to mean that Jones had the power to alter the past.[9] For he refutes these by asserting that "No action performed at a given time can alter the fact that a certain person held a certain belief at a time prior to the time in question" and "It is not within one's power at a given time so to act that something believed by an individual at a prior time to the given time was not believed by that individual at the

prior time."[10] He explains, "We feel no hesitation about assigning to Jones the power to act in such a way as to alter the fact that God will hold a certain belief in the future relative to the time of action. But it would conflict with our ordinary understanding of what is and what is not within one's power to assign Jones the power at $T_2$ to act in such a way as to alter the fact that God held a certain belief in the past relative to the time of action."[11] But we have seen that (7) and (8) need not involve the alteration of the past at all. Rather as Plantinga points out in his clear-sighted discussion of Pike's reasoning,[12] what (7) and (8) mean is not the contradiction

> 9. It was within Jones's power at $t_2$ to do something that would have brought it about that God did not hold the belief He held at $t_1$,

but rather

> 10. It was within Jones's power at $t_2$ to do something such that if he had done it, then God would not have held a belief that in fact He did hold.

Hence, it is false that

> 11. It was within Jones's power to do something that would have brought it about that God held a false belief at $t_1$,

but it is true that

> 12. It was within Jones's power to do something such that if he had done it the belief that God *did hold* at $t_1$ *would have been* false.

That is to say, the belief itself would have been false, but God would not have held it. Hence, (10) and (12) do not imply a power in Jones to change the past, but a power to do something such that were he to do it the past would have been other than it was.

Pike, however, has no firm grasp on the counterfactual dependence of God's foreknowledge on one's future actions. He admits, for example, that God "would have foreknown the opposite if the opposite was [*sic*] to happen," but charges that it is incoherent to say God foreknows what one will freely decide to do.[13] In analyzing an intimate friend's knowledge of what one will do, he asserts that though Smith *knew* that Jones would do $x$, it follows from this only that Jones did $x$, not that it was not within his power to refrain from doing $x$.[14] For though Smith's belief was *in fact* true, it *might have* turned out to be false.[15] Again, Jones could have brought it about that Smith did not have knowledge, but since Smith did in fact have knowledge, we have only to add that Jones did not in fact exercise that power.[16] If

Smith was [*sic*] a crystal ball gazer, then Jones would do what he foresaw, but Jones was [*sic*] able to falsify Smith's prior belief.[17] In these statements Pike appears to discern the counterfactual solution to the problem; but he denies that this analysis can be applied to divine foreknowledge. His reason for this denial is that God is essentially infallible, that is, all His beliefs are true and cannot be falsified. Hence, we cannot say of God's belief that it was in fact true, but might have been false.[18] "When truth is only factually connected with belief (as in Smith's knowledge) one can have the power (though, by hypothesis, one will not exercise it) to do something that would make the belief false. But when truth is analytically connected with belief (as in God's belief) no one can have the power to do something which would render the belief false."[19] Pike even goes so far as to say that if God is merely in fact omniscient, then one could escape fatalism, but not if God is essentially omniscient.[20] But clearly all this is wrong-headed: the issue is not whether Jones can act such that God held a false belief, but whether Jones can act such that God would have held a different belief than the one He in fact held. Here the "analytic connection" between God's belief and truth guarantees that God's belief would have been different had Jones acted otherwise. Hence, had Jones refrained from $x$, Smith's belief would have been false and God's belief would have been different; the counterfactual solution avails in both cases. Nor is God's essential omniscience even relevant: whether God is infallible or merely inerrant, Pike's reasoning leads to fatalism, and if the counterfactual solution is rejected then anyone's knowledge is sufficient to ensure fatalism.[21]

Pike had opportunity to clarify his argument in the debate generated by his original piece. John Turk Saunders, who had honed his weapons doing battle with Taylor's fatalism, pinpointed Pike's failure to understand the counterfactual nature of the problem.[22] According to Saunders, Jones has it within his power to perform an act such that if that act were performed, then certain earlier situations would be different from what in fact they are. Saunders observes that this is no more contradictory than having it within one's power so to act that future situations would be other than they are. "Of course we do not so act that either past or future situations are other than they are: but it does not follow from this that we lack the power so to act that they would be other than they are."[23] Saunders notes that the state of affairs of God's foreknowing at $t_1$ what Jones will do at $t_2$ does not really have to do with what is the case only at $t_1$, for the state of affairs is so described that it entails some future state of affairs. Hence, it is unproblematic that should Jones exercise his power

to refrain from $x$ at $t_2$, the situation at $t_1$ would have been other than it is. Saunders illustrates this by means of an analogy: if Saunders had refrained from writing his paper in 1965, Caesar's assassination would have been other than it is in that it would not have preceded by 2009 years his writing his paper. But it would be absurd to argue that Saunders did not therefore have it in his power to refrain from writing the paper in 1965. Pike's rejoinder to Saunders reveals that he still did not fully comprehend the difference between altering the past and the counterfactual dependence of certain past facts like divine foreknowledge on future events.[24] For he protests that while Saunders could act so as to *make* Caesar's death *different* with respect to its being prior to a certain event, he could not act to *change* the fact that, say, Caesar died on the steps of the Senate. Pike proceeds to argue that similarly if someone believed something in the past then we cannot *change* it. Pike believes that this refutes Saunders's claim that it is within one's power at a given time so to act that the past would have been other than it was. Unfortunately, Pike did not grasp the fact that Saunders is not claiming to have it within his power to change either the fact that Caesar died 2009 years prior to his writing or that Caesar died on the steps of the Senate. Both of these facts are unalterable. But the first is not simply about the past, but entails an implicit reference to a future condition which lies within one's power to actualize or not. Saunders argues that God's foreknowing $p$ in the same way entails a future state of affairs which conditions it such that were that future state of affairs not to obtain then the past state of affairs consisting of God's foreknowledge would have been different. Since one is entirely free to actualize that state of affairs or not, God's foreknowledge constitutes no constraint on one's freedom. Pike's argument degenerates even further when he then interprets Saunders to mean that it is within one's power to refrain from the action even if this means that he has the power so to act that a belief held at an earlier time was not held at that earlier time.[25] We need not follow Pike into his dark reasonings about the modifications this would force in our conceptions of "belief" and "person," for it is clear that no one has broached such views.

A decade later, Pike in response to Plantinga tried to elucidate the sense in which it is not within one's power to refrain from some action foreknown by God.[26] He apparently believes that Plantinga understands an action to be within one's power if there exists a possible world in which one performs that action—a caricature of Plantinga's position which Pike has no trouble refuting.[27] As Pike says, it would be ludicrous to claim that jumping a ten-foot fence is within

my power because my jumping it is logically possible. Observing that if I wore a blue shirt on Friday it is not within my power on Saturday to have worn a red shirt on Friday, Pike asserts that "When assessing what is within my power at a given moment, I must take into account the way things are and the way things have been in the past."[28] The possible worlds relevant to assessing what is within one's power must have the same past relative to the given moment. Thus, with regard to divine foreknowledge,

> The question is not whether there is just some possible world or other in which Jones refrains from doing $x$ at $T_2$. What must be asked is whether there is a possible world, *having a history prior to $T_2$ that is indistinguishable from that of the actual world*, in which Jones refrains from doing $x$ at $T_2$. The answer is that there is not. All such worlds contain an essentially omniscient being who believes at $T_1$ that Jones does $x$ at $T_2$. There is no possible world of *this* description in which Jones refrains from doing $x$ at $T_2$.[29]

Unfortunately, Pike has once again blundered seriously, for his analysis of "within one's power" is patently inadequate. For as Hoffman urges, not every past circumstance is relevant to assessing what is within one's power.[30] What is relevant are the physical laws and causal conditions that serve to determine one's ability, not every single past fact in the universe. On Pike's criterion, as Wainwright observes, it is not within one's power to refrain from an action if anyone, say Smith, truly believed that one would perform that action, for Smith's true belief is a fact in the actual world which would have to be duplicated in every other relevant possible world.[31] Pike's conception of "within one's power" turns out to be precisely that of Taylor and Cahn, namely, the misconstruction of the logical necessity of an entailment or of the logical impossibility of the conjunction of two contradictory propositions in terms of personal ability. Thus, Pike construes the logical impossibility of my wearing a red shirt on Friday and my wearing a blue shirt on Friday in terms of my personal ability. Similarly, the logical impossibility of Jones's refraining from $x$ in all possible worlds in which God foreknows that Jones will do $x$ is taken to indicate some impotence on Jones's part. But the logical impossibility in this case clearly has nothing to do with Jones's power or freedom. As Davis urges, ". . . it is quite beyond dispute that in all [Pike's] worlds Jones *will* do $x$ at $T_2$; . . . But merely asking us to reduce the scope of our interest to P-worlds does not . . . show that it is not within Jones' power to refrain from doing $x$ at $T_2$ (though this power . . . will obviously not be exercised)."[32] In worlds in which Jones does exercise that power, the past will be different in that God will have foreknown differently than in the actual world, and to claim

that such worlds are not within Jones's power to actualize is clearly question-begging.

John Fischer, praising Pike's case as "a powerful argument," has sought to re-defend theological fatalism against Pike's critics.[33] Pike does not, he claims, commit himself to the radical position that the ascription of a power to an agent in a world $W$ entails that the past in $W$ be as it is. Pike says only that if an agent performs an act in $W$, then any possible world $W^*$ in which he refrains must have the same past as $W$ if $W^*$ is to establish that the agent can refrain in $W$. But there may be different worlds with different past histories in which the agent can and does perform some action. So the ascription of some power to an agent need not entail the past history of a world. Fischer seems to have missed the thrust of the foregoing criticisms, however. The point is that Pike's sphere of accessible worlds is too restricted to serve as a gauge for whether an action is "within one's power." He asks us to consider that sphere of worlds which share an identical past with the action in question in the actual world and claims that there must be at least one world in which one refrains from the action if one is to be justified in maintaining that it is within one's power to refrain from that action in the actual world. But should the entire past history of the world be relevant? Why not include worlds which share the causal antecedents of one's actions, but differ in other respects? If every past fact must be the same, then fatalism results merely from anyone's antecedent true belief about an action, for there are no worlds containing that antecedent true belief in which one refrains from the action. Moreover, Pike's criterion would rule out worlds in which one refrains from the action and the past differs from that of the actual world only in virtue of God's foreknowing that one would refrain. To rule out such worlds seems clearly question-begging. It would be to demand that we perform the logically impossible if our action is to qualify as within our power. In fact, there are no worlds in which I refrain from an action that have identical pasts with a world in which I perform that action, for in all those worlds God foreknows my refraining from rather than my performing the action. Hence, Fischer's defense of Pike fails to deflect the thrust of these criticisms.

More recently, Fischer seems to have repeated this same error.[34] Under the force of Saunders's examples which show that we can do something such that, were we to do it, some fact about the past would not have been a fact, Fischer proposes a revised "fixed past" principle to undergird the fatalistic argument:

> FP*: An agent can at T do X at T only if there exists some possible world with same past relative to T as the actual world, in which the agent does X at T.

This principle is actually an attempted explication of "can freely do" or "within one's power." But once again, to make the identity of the entire past in some possible world a necessary condition of what lies within one's power is too strong. In fact, Fischer has merely repeated Pike's mistake.

In the debate that followed Pike's initial article, the issue of temporal necessity moved to the forefront, and in the next chapter we shall examine this controversy more closely. But I think the fallacies in Pike's argument for theological fatalism have become sufficiently clear to warrant the conclusion that no serious threat of fatalism issues from his quarter.

## Conclusion

In summary, then, it seems that theological fatalists have fared no better than logical fatalists in carrying their case: indeed, their fallacies are the same.[35] We have seen repeatedly a confusion between the counterfactual dependence of a past state of affairs on some future state of affairs and the logically impossible feat of changing the past. We have seen a failure to appreciate the fact that the future is unalterable in the same sense as the past, but that freedom is preserved because the future is causally open. We have seen a confusion between *necessitas consequentiae* and *necessitas consequentis* and an attendant misconstruction of "within one's power." In short, the argument for theological fatalism seems unsound.

## TEMPORAL NECESSITY

Theological fatalists will insist that their argument does not fall prey to the typical modal fallacies of logical fatalism because God's belief in the past, unlike the antecedent truth of propositions, is temporally necessary and because this same sort of necessity also characterizes the event foreknown. Now I have already had something to say on this score, but the issue has acquired such prominence in the literature that it seems worthwhile to devote a separate chapter to it.

### *Contemporary Debate from Pike to Plantinga*

#### John Turk Saunders vs. Nelson Pike

The current debate stems from Saunders's reply to Pike's original paper on fatalism. Since I have elsewhere surveyed the history of the debate on temporal necessity,[1] I shall refer the reader to that discussion and focus here on the most important and recent figures in the debate. Saunders held that it lies within my power so to act that God's foreknowledge would have been different.[2] As an illustration of such power, Saunders suggests one's ability so to act that Caesar would not have died 2009 years before the writing of his article. In his rejoinder to Saunders, Pike seizes upon the Caesar illustration and contrasts it with my ability so to act that Caesar would not have died on the Senate steps. Confessing that he has no criterion for discriminating between two such cases, Pike nevertheless believes it is clear that there are "hard" facts about the past, like Caesar's death on the steps, while other facts are not "fully accomplished" or "over-and-done-with."[3] It is only with regard to this latter category of soft facts that it is within one's power so to act that the past would have been other than it was. But a person's belief in the past is a hard fact: either he believed something or he did not, and there is nothing we can do to change it.

Pike's ingenious distinction between hard and soft facts is provocative, but it is evident that Pike himself did not fully understand it. For he repeatedly speaks of the possibility of changing hard or soft facts. He calls God's belief a hard fact because we can do nothing to change it. But neither can one change a soft fact: if Saunders had

not written his paper in 1965, no change in the facts would have oc-
curred such that "Caesar died 2009 years prior to Saunders's writing
his paper" ceased to be a fact any longer—rather it would not have
been a fact at all. Any fact, whether hard or soft, is unalterable;
but soft facts seem to be counterfactually dependent on later states
of affairs in a way hard facts are not. In the case of God's belief,
God's foreknowledge is definitely conditioned by what will occur in
the future. In any case, Pike himself undermines his case for fatalism
when he admits that what is logically impossible is the *conjunction*
of God's belief that I should do *a* and my failing to do *a*, for this in
no way refutes the claim that if I were to refrain from doing *a*, God
would have believed otherwise.

## Marilyn Adams

Marilyn McCord Adams, fresh from her doctoral dissertation under
Pike on Ockham's views of divine foreknowledge and human freedom,
sought to bring some precision to the distinction between hard and
soft facts.[4] Adams wants to argue that the existence of God is not a
hard fact. She defines a hard fact as follows:

> 1. "Statement *p* expresses a hard fact about a time *t*"=$_{df.}$ "*p* is
> not at least in part about any time future relative to *t*."

The notion of being at least in part about a time *t* she defines as
follows:

> 2. "Statement *p* is at least in part about a time *t*"=$_{df.}$ "The hap-
> pening or not happening, actuality or non-actuality of something
> at *t* is a necessary condition of the truth of *p*."

Now it is an analytic truth that God is everlasting. If any being *x* is
God, then if *x* exists at some time *t*, *x* exists at all *t*. That is,

> 3. "*x* is God and $(\exists t)$ (*x* exists at *t*)" entails "$(t)$ (*x* exists at *t*)."

According to (3), that *x* exist at all *t* is a necessary condition for any
*x*'s being God. Hence, (3) is in part about the future. Therefore, "*x*
is God" does not state a hard fact about any time for which later
times exist. So one cannot conclude that if *x* is God at *t*, then no
one can have it within one's power at *t*´ to act such that *x* would not
exist at *t*´—although no one will in fact exercise that power. And, of
course, if *x* were not God at *t*´, neither would he have been God at
*t*. Now Adams believes one does have the power to act in such a way
that *x* would not be God. For since God is omniscient, "*x* believes *p*"
entails "If *x* is God, then *p*." Since God believes all true propositions,
if *x* is God then *x*'s beliefs about the future must be true. So it is a

necessary condition of any $x$'s being God that certain things happen in the future. If then those things were not to happen in the future, $x$'s beliefs would be false and he would not be God. She concludes, "No reason has been given to suppose that Jones may not have the power at $t_2$ so to act that the belief of $x$ at $t_1$ would be false even though the belief of $x$ at $t_1$ was in fact true: namely the power at $t_2$ to refrain from mowing his lawn."[5]

Adams's attempt to provide a criterion for Pike's distinction between hard and soft facts sparked further controversy. Helm argues that her definition would require that statements expressing dispositional properties do not state hard facts.[6] For example,

4. Substance $s$, now before us, is indestructible

implies

5. If anyone at a later time tries to destroy $s$, he will fail.

But the fact of $s$'s indestructibility, protests Helm, is as much a fact about it as its shape. Adams would have to agree with Helm that dispositional properties are soft facts, and she might also agree that they are just as much facts about an object as non-dispositional properties. The difficulty comes when one reflects that it is physically impossible to destroy an indestructible substance, so that it is not within one's power to do anything that would destroy the substance. Hence, the indestructibility of the substance is on Adams's definition a soft fact which is not within anyone's power to affect counterfactually— and this does not seem to capture the intuitions about softness and hardness. Moreover, Helm argues, on her definition virtually any fact becomes soft.[7] For

6. Caesar died and his body rotted away in 44 B.C.

implies

7. Caesar's heart will not restart.

And

8. Jones completed A at $t_1$

entails the falsity of

9. Jones is completing A at $t_2$.

Boothe adds that since

10. God will believe that $p$

is a soft fact and also a necessary condition of $p$, it follows that no sentence $p$ expresses a hard fact.[8] Fischer also contends that Adams's definition cannot handle complex propositions like

11. Either Smith knew at $t_1$ that Jones would do $x$ at $t_2$ or Jones believed at $t_1$ that Jones would do $x$ at $t_2$.

Now (11) as such entails nothing about the future and so expresses a hard fact. But suppose the second disjunct to be false. Is it not then the case that (11) is soft, since Jones could act so as to falsify the first disjunct and so render (11) false?[9] Actually what Fischer's argument shows is not that (11) is soft, for it is clearly hard under Adams's definition, but that Jones could act so as to counterfactually affect a hard fact. So once again, Adams's distinction does not adequately capture one's intuitions about softness and hardness. On Adams's definition, then, it follows that many soft facts are counterfactually closed, many hard facts are counterfactually open, and all facts are ultimately soft facts.
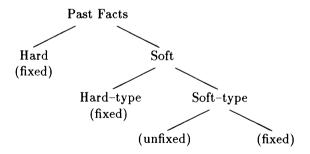
## John Fischer

Fischer has tried persistently to demonstrate that God's foreknowledge, unlike human foreknowledge, is a hard fact.[10] A soft fact, he asserts, is a fact *in virtue* of the events which occur in the future. Now suppose Smith knew at $t_1$ that Jones did $x$ at $t_2$. The same state of Smith's mind will count as knowledge or not in virtue of Jones's act. Analogously, in God's case ". . . the only way in which God's belief at $T_1$ about Jones at $T_2$ could be a soft fact about the past relative to $T_2$ would be if one and the same state of the mind of the person who was God at $T_1$ would count as one belief if Jones did $x$ at $T_2$, but a different belief (or not a belief at all) if Jones did not do $x$ at $T_2$."[11] Now, despite Fischer, this does not at all seem what the defender of foreknowledge is committed to; rather he maintains that God would have had a different state of mind had Jones done differently than he did. Fischer proceeds to acknowledge this, but maintains that such a contention weakens the argument for God's belief being a soft fact. For now the case of God is different from the cases of Smith and Caesar. The difference, however, is purely incidental: the point remains that God believes what He does in virtue of events which occur in the future. Therefore, His believing something is as much a soft fact as Smith's knowing something.

More recently, Fischer has argued that even if God's past beliefs are soft facts, they are still "fixed" soft facts, so that divine foreknowledge precludes human freedom.[12] Fundamental to Fischer's analysis is the distinction he sees between a fact's hardness and its fixity. The hardness of a fact has to do with whether it entails the future obtaining of a contingent fact which is, in some suitable sense, immediate at that future time; if not, it is a hard fact, but if so, it is soft. The fixity of a fact, on the other hand, has to do with whether it is susceptible
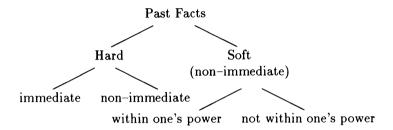
to being affected by events which are within one's power; if one is able to act such that a fact would not have been a fact, then it is not fixed, but if one cannot so act that a fact would not have been a fact, then the fact is fixed.[13] Utilizing this distinction, Fischer proceeds to argue that a past fact's being soft does not entail its lack of fixity. A past fact may entail a future fact which I am powerless to affect and hence be both soft and fixed. God's beliefs about future contingents are, Fischer contends, precisely in this class of fixed, soft facts. In this connection, Fischer distinguishes two types of soft facts: those which ascribe to an object a "hard" property, that is, a temporally immediate, non-relational property, and those which do not. Now "having a belief" is, according to Fischer, a "hard" property. Due to His essential omniscience, this property, when ascribed to God, can result in a soft fact, namely, "God believes that $p$," where $p$ is some future-tense proposition. But the softness of this fact does not obviate the hardness of the constituent property. Fischer maintains that it is plausible that no human being can act at $t_2$ such that some bearer of a hard property relative to $t_1$ would not have possessed that property at $t_1$. Hence, due to the hardness of the property "having a belief," God's belief that $p$ is a fixed, soft fact about the past, or what Fischer calls a "hard-type soft fact." It follows that if God has exhaustive knowledge of the future, then human freedom is precluded.

One thus arrives at the following classification of facts about the past:

Past Facts

Hard (fixed) — Soft

Soft → Hard-type (fixed) — Soft-type

Soft-type → (unfixed) — (fixed)

This analysis seems, however, confused. What Fischer ought to have done was to reject the distinction between hardness and fixity and to stick by his own intuitive understanding of a soft fact in his earlier piece, namely, that a soft fact is a fact *in virtue* of events which will occur in the future and therefore is not fixed. Any fact that is fixed is *ipso facto* a hard fact because it is not a fact in virtue of events which will occur in the future. Hardness and fixity are thus

equivalent notions. What Fischer himself expressed as the "hardness" or "softness" of a fact would have been better expressed in terms of the "immediacy" of that fact or of a proposition about that fact. Similarly, when Fischer speaks of the fixity of a fact, what he really seems to have in mind is whether it lies within one's power to act in such a way as to affect that fact. Accordingly, the above classification ought to be recast as:

```
                        Past Facts
                      ╱           ╲
                  Hard             Soft
               ╱       ╲        (non–immediate)
          immediate   non–immediate  ╱        ╲
                    within one's power     not within one's power
```

What Fischer wants to say is that God's past beliefs, though non-immediate, are still hard facts. The Ockhamist's point is that God's believing $p$ is a soft fact and that therefore we can in certain cases act in such a way that, were we so to act, God would not have believed $p$.

The Ockhamist's point seems difficult to deny. For if God is essentially omniscient, then it seems undeniable that I can act in such a way that, were I to do so, God's belief would have been different. Is it then within my power to do differently? Well, why not? On the libertarian assumption, I am causally free to perform or to refrain from some action. So what constrains me?

In his earlier articles, as we have seen, Fischer's answer came in the form of some sort of "fixed past principle" according to which there is no action which an agent can perform such that if he were to do so, some past fact would not have obtained. Now in his more recent contribution, Fischer says virtually the same thing with respect to "hard-type" soft facts (= non-immediate, hard facts). No one can act in such a way that a hard property would not have been possessed by the bearer of that property. And the reason "having a belief" is a hard property is because it is possible for a person to be in the same dispositional state of believing whether or not that belief turns out to be true.[14] But how is this relevant to the question at hand? The issue is *God's* believing that $p$, not just the isolated property of "believing that $p$." So long as the fact of God's believing that $p$ is a soft fact

about the past, it seems irrelevant whether the isolated property is hard nor not. So long as the fact of God's belief is a fact in virtue of some future event, it is not fixed until that event transpires, and if that event lies causally within our power, there seems to be no reason for denying that we have the power to act in such a way that God's past belief would have been different, were we so to act.

Of course, Fischer recognizes that the Ockhamist will say that even if God's belief is a fact involving a hard property, it is nonetheless not a fixed fact about the past. Fischer concedes that ". . . I haven't established that no human can so act that some actual bearer of a hard property in the past wouldn't have had that property;" but he disclaims any need to do this because the Ockhamist has not offered any "non-question-begging examples of hard-type soft facts (relative to certain times) which are, intuitively, not fixed at later times."[16] But whose responsibility is it to bear the burden of proof here? It is the theological fatalist who contends that divine foreknowledge of future contingents is impossible. It is he, therefore, who must demonstrate that impossibility if we are to reject this traditional doctrine as incoherent. The Ockhamist need only present his view as a refutation of the fatalist's argument that foreknowledge and freedom are inconsistent. The Ockhamist is under no obligation to furnish other examples analogous to God's foreknowledge; he could maintain that divine prescience is *sui generis*. It is Fischer or the fatalist who must prove some sort of "fixed past principle" if his argument is to be successful. Since Fischer has proven neither of these, his argument for theological fatalism fails.

But is it in any case true that the Ockhamist is at such a loss for examples of soft facts which involve hard properties but which are nevertheless not fixed at later times? I think not.[17] As we have seen, in the debates over backward causation, tachyons, time travel, and precognition, and as we shall see in the debate over Newcomb's Paradox and the Special Theory of Relativity, fatalistic arguments concerning past facts which are every bit as hard as God's beliefs have been effectively rebutted by philosophers working in those fields. The Ockhamist is therefore by no means destitute of examples of non-theological facts which Fischer would call "hard-type soft facts." I hope that the theological fatalist would not take the easy and evasive route of claiming that such examples are "question-begging," for then I simply do not know what he is asking for. Of course, in furnishing such examples at all, the Ockhamist is performing an act of philosophical supererogation, since it is the theological fatalist whose

burden it is to prove some incoherence in the traditional doctrine of divine foreknowledge and human freedom.

Alfred J. Freddoso

Undoubtedly the most sophisticated analysis of temporal necessity, or, as he prefers, accidental necessity, comes from the pen of Freddoso. He alleges that previous attempts to formulate a convincing account of temporal necessity have failed primarily because they have not articulated precisely the thesis of the metaphysical primacy of the pure present and have not distinguished clearly between temporal and causal necessity.[18] He begins by listing four basic properties of temporal necessity:[19] (i) The necessity of a temporally necessary proposition is accidental to it; hence, only logically contingent propositions can be temporally necessary or impossible. (ii) A proposition's being temporally necessary/impossible is relative to a time, such that for any moment $t$ logically contingent propositions may be divided into three jointly exhaustive and mutually exclusive groups: those which are temporally necessary at $t$, those temporally impossible at $t$, and those temporally contingent at $t$. (iii) A proposition's being temporally necessary/impossible at $t$ entails that it remains so at every moment after $t$, so that no agent has it within his power to make a temporally necessary proposition false or a temporally impossible proposition true. (iv) When we limit the consequents to logically contingent propositions, temporal necessity is closed under entailment, that is, if $p \prec q$ and $q$ is logically contingent, and $p$ is temporally necessary at $t$, then $q$ is temporally necessary at $t$. Given that no one can have the power to make a logically necessary proposition false, it follows from (iii) and (iv) that if $p \prec q$, and $p$ is temporally necessary at $t$, then no one has the power at or after $t$ to bring it about that $q$ is or will be false.

The heart of the matter, then, is to delineate which propositions are temporally necessary at any moment. Freddoso proposes the following formulation of temporal necessity for any proposition $p$ true at time $t$ in a possible world $w$:[20]

> 12. $p$ is temporally necessary at $(w, t)$ iff (i) $p$ is logically contingent and (ii) $p$ is true at $t$ and at every moment after $t$ in every world $w^*$ such that $w^*$ shares the same history with $w$ at $t$.

The critical notion in this definition is that of two worlds' sharing the same history at $t$. Freddoso suggests that we take this to mean that two worlds $w$ and $w^*$ have identical series of $t_i < t$ and that for any submoment $k$ and time $t_n < t$, $k$ obtains at $(w, t_n)$ iff $k$ obtains at

$(w^*, t_n)$. In order to understand this explanation, one must define the notion of a submoment. A submoment for any $(w, t)$ is the set of immediate propositions true at $(w, t)$. An immediate proposition $p$ must be (i) an atomic, non-quantified, present-tense proposition and (ii) temporally indifferent, such that either (a) $p$ is not logically contingent or (b) it is possible that $p$, as well as its negation, be true at a first, a last, or an intermediate moment of time. The intuitive justification behind construing "two worlds' sharing the same history" in terms of their having identical submoments Freddoso calls the metaphysical primacy of the pure present.[21] This is the intuition that a future-tense proposition is true now because the appropriate present-tense proposition will be true in the future. There is an asymmetrical dependence of the truth-values of future- and past-tense propositions on the future and past truth values of the appropriate present-tense propositions. Freddoso summarizes his view,

> I take the claim that the pure present is metaphysically primary to be tantamount to the assertion that for any moment $t$ and any logically possible world $w$ there is a set $k$ of purely present-tense propositions such that (a) each member of $k$ is true at $t$ in $w$ and (b) $k$ determines what is true at $t$ in $w$ in a temporally independent way, i.e., in a way which does not temporally depend on what has been or will be true at moments of $w$ other than $t$. I will call this set the *submoment* of $t$ in $w$, and I will say that a given submoment obtains when and only when each of its members is true . . . . two worlds share the same history at a moment $t$ just in case they share all and only the same submoments, obtaining in exactly the same order, prior to $t$. Finally, . . . a proposition $p$ is necessary *per accidens* at $t$ in $w$ just in case $p$ is true at $t$ and at every moment after $t$ in every possible world which shares the same history (in the above sense) with $w$ at $t$.[22]

On this basis, Freddoso is able to elude the argument of logical fatalism based on the temporal necessity of an antecedently true future-tense proposition. For while, for example, the proposition, "Socrates drank hemlock" is now temporally necessary, since "Socrates drinks hemlock" is a member of a past submoment which obtains prior to the present in any world sharing the same history prior to the present with our world, a proposition like "Katie will wash her car" is not a member of any submoment, though if it is true it has always been the case that she will wash her car. There are therefore other worlds sharing identical histories with our world in which "Katie will wash her car" is at no time true. Hence, this proposition, even if true, is not temporally necessary, and so the argument for logical fatalism fails.

Now in assessing Freddoso's proposal, it is important to dispel at once the impression, sometimes given by Freddoso himself, that by a

world's history prior to $t$ he means the temporal series of events prior to $t$. Freddoso's submoments and histories built of them are purely abstract entities constituted by propositions true at various times. Hence, it is very misleading for him to assert,

> But the past hopes, fears, beliefs, desires, predictions, etc., of historical agents are clearly unalterable elements of our past and must be counted as part of our history by any explication of what it is for two worlds to share the same history at a given time. No world $w$ can claim to share the same history with our world now if in $w$ Chamberlain did not fear that Hitler would not keep his word, or if in $w$ Ernie Banks did not hope (and predict) every spring that the Cubs would win the pennant.[23]

But precisely on Freddoso's account such attitudes and actions of historical agents may not be part of the world's "history." For as he explains elsewhere, states of affairs involving present-tense propositional attitudes directed at future-tense propositions are not immediate if they entail the future-tense propositions involved.[24] Thus, propositions like

13. God believed Israel would be saved

and

14. God promised that Israel would be saved,

are non-immediate and, hence, not part of any submoment. The same goes for attitudes directed at past-tense propositions, like

15. God remembered that He had made a covenant with Abraham

and

16. God assured Joseph that the king had died.

Moreover, in cases of divine revelation, the actions and attitudes of human persons cannot be counted as part of the world's history, for example,

17. Isaiah prophesied the fall of Jerusalem

and

18. Daniel dreamt that the Babylonian Empire would be overthrown.

Thus, Freddoso seems very unfair in charging the logical fatalist, who holds that the antecedent truth of future-tense propositions is part of our history, with "outrageously inflated ideas of actuality and history."[25] This same common sense appeal would with equal justice lead one to conclude that Freddoso has an outrageously emaciated concept of actuality and history. But neither the fatalist nor Freddoso are discussing the historian's history, so to speak, and so such appeals ought to be left entirely aside.

The linch-pin in Freddoso's account is his explanation of immediacy.[26] His explanation requires that in order for a logically contingent proposition to be immediate, it, as well as its negation, be such that is true in some possible world $w$ at time $t$, where $t$ is the last moment in $w$. But his explanation of the temporal indifference of an immediate proposition seems inadequate. For suppose that the toss of a penny turning up heads at $t_1$ is the result of backward causation by some agent at $t_2$. In that case the truth of

19. The toss of the penny turns up heads

depends upon the future truth of

20. The agent acts to cause the penny to have turned up heads.

The outcome of the toss is counterfactually dependent upon the agent's action as a consequence upon a condition, and after the toss but prior to the agent's action it is still possible for the agent to act otherwise, such that (19) would have been false. Accordingly, (19) would seem to be non-immediate. But on Freddoso's definition, it is immediate, for there are worlds in which the penny turns up heads at $t_1$ and $t_1$ is the last moment of time. Of course, in such worlds the toss is not retroactively caused. But because (19) does not entail a future moment, even though it implies one, (19) counts as temporally indifferent. Therefore, (19) is true in every world sharing the history of our world up through $t_1$, and the past tense version is, hence, now that $t_1$ is past, temporally necessary. Yet it remains within the agent's power to bring it about that (19) is false. What sort of necessity is this?

Freddoso himself seems to sense that something is amiss here, for he states that his account presupposes the logical impossibility of time travel.[27] He explains that proponents of time travel assert in effect that few propositions are temporally necessary because it is within the power of the time traveler to render true past-tense propositions false. He could, for example, return to Socrates's death scene and prevent his drinking the poison. Of course, we know that he will not exercise such power, but nonetheless he does have this power. Were he to exercise this power, the past would have been different than it was. Hence, virtually no past-tense propositions would be temporally necessary. Unfortunately, Freddoso seems rather cavalier in his brushing aside the possibility of time travel.[28] He does claim that time travel rests on uncertain metaphysical assumptions; and with this one can agree. But then Freddoso's presupposition should have been the metaphysical, rather than logical, impossibility of time travel. This adjustment of the modality involved would not in itself vitiate his ac-

count, so far as I can see, since any world that could be actual would preclude time travel and thus preserve temporal necessity. Now if Freddoso is correct in his judgement that time travel is incompatible with temporal necessity, then he should also have presupposed the metaphysical impossibility of backward causation and precognition as well, for these have precisely the same implications for the past as time travel.[29] For example, Ernie Banks's springtime delusions could have been retroactively caused by some later mad sportswriter bent on humiliating the Cubs. It is within his power to do the same to Ron Santo, though we know he does not exercise this power. Again, Chamberlain's fears could have been precognitions of Hitler's invidious acts. Hitler, by refraining from the invasion of Poland, could thus have acted in such a way that Chamberlain would never have entertained such fears. It is interesting to note, then, that in Freddoso's understanding, one cannot accept the possibility of time travel, backward causation, and precognition and hold to the temporal necessity of most past-tense propositions.

But it might be asked whether Freddoso is not asking us to presuppose too much. For even if we reject time travel, backward causation, and a retrocausal account of precognition as metaphysically impossible, still one cannot so dismiss non-retrocausal theories of precognition, to say nothing of the experimental evidence for precognition. More importantly, not only would precognition be incompatible with Freddoso's account, but, as we shall see, so would divine foreknowledge. Time travel and divine foreknowledge are remarkably parallel, and so it is here: if time travel is incompatible with temporal necessity, then so is divine foreknowledge. Therefore, we shall need to explore further in the sequel whether Freddoso is constrained to presuppose the impossibility of time travel in order to preserve temporal necessity.

## Alvin Plantinga

Plantinga, accepting as a point of departure Marilyn Adams's definition of a hard fact as a fact strictly about the past, breaks loose the notion of temporal necessity from "hardness" and "softness."[30] Observing that discussions of temporal necessity refer to what lies within one's power, he suggests that temporal necessity be defined in terms of powers of agents:

> 21. $p$ is temporally necessary at $t$ iff $p$ is true at $t$ and it is not possible both that $p$ is true at $t$ and that there exists an agent $S$ and an action $A$ such that (i) $S$ has the power at $t$ or later to

perform $A$ and (ii) if $S$ were to perform $A$ at $t$ or later, then $p$ would have been false.

Under this definition many soft facts, as expected, will not be temporally necessary. For example, a proposition like

22. Eighty years ago it was true that Paul would mow his lawn in 1999

will not be temporally necessary because it is within Paul's power to refrain and so (22) would have been false had he done so. But by the same token,

23. God believed eighty years ago that Paul would mow his lawn in 1999

is also not temporally necessary, since Paul can refrain and were he to do so, God would have believed differently. The defender of foreknowledge is thus vindicated. But Plantinga goes on to note an unexpected consequence of this doctrine: virtually no logically contingent facts—hard or soft—about the past are temporally necessary. For suppose that were I to act differently, God would have foreknown this and hence would not have actualized certain states of affairs that He did. Suppose, for example, that

24. If Pilate would have been just, he would not have crucified Jesus.

Suppose, further, that God's sole purpose in sending Christ was for him to die an expiatory death. Accordingly,

25. If Pilate would have been just, Jesus would not have been born.

It follows that it was within Pilate's power to act in such a way that were he to have so acted then Jesus would not have been born. Hence, even hard facts like Jesus's birth are not temporally necessary. Indeed, says Plantinga, it is difficult to think of *any* contingent facts about the past that are temporally necessary—about the only example he can think of is

26. There have been agents

since no one could act in such a way that no agents, including himself, would have existed.

It seems to me, however, that Plantinga misleads us in his suggestion that temporal necessity be *defined* in terms of the power of agents. I see no intuitive warrant for reference to agents in defining temporal necessity.[31] What Plantinga tells us about the relation of temporal necessity and the power of hypothetical agents is true enough, but I do not see that this defines temporal necessity, since

our intuitive understanding of that notion involves no necessary reference to what lies within the power of agents. The unsuitability of Plantinga's definition becomes evident when we reflect on the fact that his one example of a temporally necessary truth—"There have been agents"—is not temporally necessary because of the absence of any counterfactual dependence on the future, but because it would be self-referentially absurd to say any agent has the power to bring about its contradictory—a consideration which seems irrelevant to our intuitions about temporal necessity and contingency.

But if Freddoso's definition thus seems intuitively superior, nevertheless Plantinga's deliberations on divine foreknowledge and its implications for temporal necessity are extremely instructive. For Plantinga shows that divine foreknowledge seriously compromises the necessity of the past. Moreover, it is evident that if $S$ is a time traveler rather than a foreknowing God, the same sort of implications follow for temporal necessity. That is why Freddoso presupposed the impossibility of time travel. But what we now see is that divine foreknowledge is as incompatible with temporal necessity as is time travel. If Freddoso is correct, therefore, that his account presupposes the impossibility of time travel, then either it must also presuppose (but without comparable warrant) the impossibility of divine foreknowledge or else suffer from the same sort of consequences implied by time travel.

Plantinga, for his part, proposes to revise his former definition in order to harden up the past:

> 27. $p$ is temporally necessary at $t$ if and only if it is not possible both that $p$ be true and that there exists an action $A$ and an agent $S$ such that (i) $S$ has the power at $t$ or later to perform $A$ and (ii) *necessarily*, if $S$ were to perform $A$ at $t$ or later, then $p$ would have been false.

By requiring that the performance of the action *entail* the falsehood of $p$, Plantinga aims to eliminate all backtracking counterfactuals which are merely possibly or *de facto* true. Thus, while, say,

> 28. If Pilate had been a just man, God would have foreknown this

is necessarily true,

> 29. If Pilate would have been just, Jesus would not have been born

may or may not be true. By tightening up his definition so that the counterfactual must be necessarily true, Plantinga preserves God's foreknowledge as a soft fact while rendering merely possibly counter-

factually dependent facts or even *de facto* counterfactually dependent facts hard facts.[32]

Plantinga's chosen route thus takes him into further complications that have no intuitive warrant. If (21) did not capture our intuitive understanding of temporal necessity, (27) does less so, for the introduction of the entailment requirement seems arbitrary and *ad hoc.* Worse, if (21) seemed too weak, (27) is too strong. For while (21) allowed that propositions about facts that were even *possibly*, though not actually, counterfactually dependent on future facts to be temporally contingent, (27) denies that propositions about facts which really are, though only *de facto*, counterfactually dependent on future facts are temporally contingent. But this is the same problem we encountered in Freddoso's account of immediacy and temporal indifference. Events or actualities which do depend on future events or actualities, not necessarily but *de facto*, are declared to be temporally necessary. This seems clearly wrong; for if it is true that

> 30. If I were not to pray tomorrow, my son would not have been saved yesterday

then how is it that

> 31. My son was saved yesterday

is, as Plantinga claims, temporally necessary, rather than temporally contingent? Moreover, even if (31) is temporally necessary, I still have the power through tomorrow to act in such a way that were I to so act, (31) would have been false. So long as Plantinga is willing to allow divine foreknowledge, time travel, backward causation, and so forth, it seems unjustified to call temporally necessary those events which are, through such operations, actually counterfactually dependent upon future events as consequences upon conditions.

## Assessment of the Debate

### Toward Understanding Temporal Necessity

*Time Travel, Foreknowledge, and Temporal Necessity*

It would seem therefore that a successful attempt to draft a theory of temporal necessity is still forthcoming. Freddoso's would appear to come the closest, but we have seen that his account must arbitrarily presuppose the impossibility of divine foreknowledge, if he is correct that it presupposes the impossibility of time travel. But is he in fact correct that his account presupposes the impossibility of time

travel? It seems to me that he is not. Freddoso never explains at any
length precisely where the incompatibility between time travel and
temporal necessity arises. It might be thought that his explanation
of immediacy and temporal indifference is undercut by time travel.
The truth of any past-tense proposition (say, "Socrates drank hem-
lock") might be thought to depend upon the future truth of some
other proposition (say, "The time traveler does not visit Greece")
and cannot therefore be temporally necessary. This would, however,
be a misinterpretation. On Freddoso's account, a proposition, or its
negation, must entail a future (or past) moment in order for it not
to be temporally indifferent. But clearly "Socrates drank hemlock"
does not entail any other moment of time and is therefore temporally
indifferent. Indeed, even propositions concerning events which are *de
facto* dependent upon a time traveler's acts are temporally indifferent.
Suppose, for example, that in the actual world it was the time trav-
eler who poisoned Socrates. In that case, "Socrates drank hemlock"
depends for its truth value upon the future truth of certain proposi-
tions about the time traveler's actions; nevertheless, this proposition
is still temporally indifferent since it is true in some possible world at
a last moment of time, a world in which the poison is not supplied
by any time traveler. Of course, some propositions about time travel
will not be temporally indifferent, for example, "Socrates was killed
by a time traveler." But in general, there is no reason to think that
the possibility of time travel undermines Freddoso's account of imme-
diacy. This is doubly true for the possibility of divine foreknowledge:
even propositions about events wrought by God in virtue of His fore-
knowledge, like "Jesus was born," are temporally indifferent in their
present-tense versions, since there are worlds in which such events oc-
cur at a last moment of time, not being wrought due to foreknowledge
of coming events.

Thus, it is not Freddoso's account proper which is incompatible
with the possibility of time travel or divine foreknowledge. We may
grant that such possibilities obtain and are operative in the actual
world and still hold pretty much the same propositions to be tempo-
rally necessary as we should if these notions were presupposed to be
impossible. Rather the problem is that temporal necessity then be-
comes altogether trivial with respect to what is or is not within one's
power. This brings us back to Freddoso's third property of temporal
modality. If time travel and divine foreknowledge exist, then it is
still the case that if a proposition is temporally necessary at $t$, then
it remains temporally necessary at every moment thereafter. But it
is not true that no agent therefore has it within his power to make

a temporally necessary proposition false. For we are allowing the possibility of time travel and divine foreknowledge, which imply that although some proposition is temporally necessary, still it lies within one's power to act in such a way that were one so to act, that proposition would have been false. Suppose, for example, that it is true that

32. Banks predicted a Cubs' pennant in 1966.

The present-tense version of (32) is immediate and a member of a submoment. Hence, (32) is now temporally necessary. Nonetheless, a time traveler has it within his power to journey into the past and prevent Banks's prediction. Similarly, perhaps God would have prevented his prediction had He foreknown that the Cubs would win in 1966. The 1966 Cubs team therefore had it within its power, by winning the pennant (remember, this is purely hypothetical!), to bring it about that Banks had not made such a prediction. So the notion of temporal necessity does not itself presuppose the impossibility of time travel or divine foreknowledge; rather temporal necessity just does not amount to much once these are granted. Even if we have good grounds for assuming the metaphysical impossibility of backward causation and, hence, of time travel, we have no such grounds for rejecting divine foreknowledge and so are left with a temporal necessity which seems inconsequential.

Now if it seems peculiar to call propositions temporally necessary which we may render false, perhaps one ought to reconsider one's definition of temporal necessity. I suggested that it seems odd that propositions about events which are counterfactually dependent upon future events as their conditions should be called temporally necessary. Why could we not, therefore, reinterpret Freddoso's account of temporal indifference in such a way that an atomic, present-tense, non- quantified, logically contingent proposition $p$ is temporally indifferent iff $p$ is true and $p$ would be true even if the future were annihilated? Under such an interpretation a proposition concerning events which are in fact consequences of future events, such that were the latter not to be, the former would not have been, is not temporally indifferent and therefore not immediate nor a member of a submoment and therefore not temporally necessary. If we agree that backward causation is metaphysically impossible, then we may nonetheless hold that divine foreknowledge exists and maintain that only temporally contingent propositions lie within one's power to falsify. For we can only falsify propositions concerning past events if such events would not be wrought by God were we to act differently. Other events would

remain unaffected by our actions and, hence, propositions about them cannot in fact be falsified.

## Hard Facts and Soft Facts

On the above basis, I think we are prepared to make sense of the distinction between hard facts and soft facts. It seems to me that Adams has misdirected the debate over temporal necessity by defining these notions in terms of logically necessary future truth conditions. As her critics have shown, such a definition is untenable, and she now freely admits not only that her definition was inadequate but also misrepresented Ockham. Now on the basis of our *Auseinandersetzung* with Freddoso's views, it seems to me that a fact is soft iff it is a past or present event or actuality which is counterfactually dependent upon some future event or actuality in such a way that the earlier event or actuality is a consequence of which the later event or actuality is the condition. A fact is hard iff it is a past or present event or actuality which is not so dependent. The counterfactual dependence here spoken of concerns the "would" counterfactual relation ("□→"), not the "might" relation ("◇→"). The "future" referred to here means, not "future relative to the earlier event," but "future relative to the present." The use of the terms "consequence" and "condition" indicates that one is not speaking here of logical conditions, but of conditions in the asymmetrical sense discussed by Wertheimer. To say a past fact is soft entails the claim that were some future condition to be other than it will be, then that past fact would as a consequence have been different than it was. By contrast, to say a past fact is hard is to say that no matter how future conditions might vary, the past fact would have been the same in every case. Whether a fact is hard or soft will determine whether a proposition about it is temporally necessary or contingent.

## Temporal Necessity and Contingency

We can on the basis of our prior discussion state that a proposition is temporally necessary iff it expresses a hard fact and temporally contingent iff it expresses a soft fact. A proposition moves from being temporally contingent to temporally necessary once the future condition becomes itself a hard fact. Thus, Saunders's then temporally contingent

33. Caesar died 2009 years prior to Saunders's writing his article

is now temporally necessary, since Saunders's writing his article is not—so far as we know—itself a soft fact counterfactually dependent on some future event or actuality. Propositions thus become temporally necessary once all future conditions on which they are counterfactually dependent become hard facts themselves.

Now consider

34. God believed that $p$

where $p$ is a future-tense proposition. Is (34) temporally necessary? The answer, as we have seen repeatedly, is, no. For God's belief is counterfactually dependent upon and conditioned by the events or actualities described in $p$, such that if these were different, then God's belief would have been different. The claim that God's beliefs about the future are hard facts and that (34) is therefore temporally necessary is without foundation.

*"Hardness" as a* De facto *Property*

But this construal of temporal necessity has the consequence that which facts of the past are hard and which soft is a merely factual matter and that for all we know, given God's foreknowledge and freedom of action, virtually every fact about the past is soft. That is to say, "hardness" and "softness" are not dispositional properties of facts, but simply characterize things *de facto*. Past facts are either hard or soft, depending on whether they are counterfactually dependent on future events or actualities; the problem is that there is no empirically manifest property of hard facts that serves to mark them off from soft facts. Some facts about the past, no doubt most, are hard, but we have no way apart from revelation of knowing which they are. There are doubtless a great many facts of the past which are hard and which God would not have failed to actualize no matter what course the future were to take. Accordingly, propositions about such facts are temporally necessary. Of course, only God knows—or those to whom He chooses to reveal it—which facts of the past are hard or soft and accordingly which propositions are temporally necessary or contingent. But this ignorance on our part is no reason for denying that some facts about the past really are hard facts—we simply lack the knowledge of God's motives and reasons for doing things so as to ascertain what He would have done differently should some future event not occur.

## Backward Causation and Intuitions
## of the Past's Necessity

### Causal Closedness of the Past

Now it might be wondered why, if the past via God's foreknowl-
edge and action is virtually as counterfactually open as the future,
do we have such strong intuitions about the necessity of the past,
intuitions often expressed in terms of the unalterability of the past?
The answer, I have suggested, lies in the impossibility of backward
causation. Given an A-theory of time, it is metaphysically impossible
for a present event to have a future cause. Causal series run forward
in time, not backward, and thus it is impossible for us to act as ef-
ficient causes in bringing about past events. It is this metaphysical
impossibility which generates our intuitions of the necessity of the
past. For while God may cause events to be different based on His
foreknowledge of my free acts, I cannot myself act to causally bring
about those past events—the only exercise of causality is on God's
part and it is not retroactive.

This account of our intuitions concerning the necessity and unalter-
ability of the past should help to assuage the misgivings of those who
would insist that the past be counterfactually closed. David Lewis,
for example, allows that if the present were different, the future would
be different, but denies that the past depends counterfactually on the
present.[33] He recognizes that we cannot change the future any more
than the past—both are alike immutable. But what we can do by
way of "changing the future" is to bring it about that the future
is the way it actually will be, rather than any of the other ways it
would have been if we had acted differently in the present. That is,
says Lewis, something like change; we do make a difference. But it is
not literally change, since the difference we make is between actuality
and other possibilities, not between successive actualities. The literal
truth is just that the future depends counterfactually on the present.
By contrast, something we ordinarily cannot do by way of "changing
the past" is to bring it about that the past is the way it actually
was, rather than some other way it would have been if we had acted
differently in the present. The past would be the same, however we
acted now. Because the past does not at all depend on what we do
now, it is counterfactually independent of the present.

Now Lewis, it seems to me, is correct about our inability to bring
about the past insofar as we understand "bringing about" as a syn-
onym of "efficiently cause." But if "bringing about" is taken more

widely to include any counterfactual relation—and this is clearly
Lewis's intention—then he is mistaken. For clearly many facts about
the past like Caesar's dying 2009 years prior to my writing are coun-
terfactually dependent on the present. Perhaps Lewis would simply
not regard such cases as "ordinary." He himself allows that in cer-
tain cases "back-tracking" counterfactuals are legitimate and require
a special resolution of vagueness among the possible worlds in which
the antecedent of the counterfactual is true so as to permit the worlds
deemed to be closest to the actual world to be worlds in which some
feature of the past is different. We may allow that a special resolu-
tion should be used only in extraordinary cases,[34] but certainly the
counterfactual dependence of the foreknowledge of an omniscient be-
ing upon future events and actualities is an extraordinary case. More
than that, if God is essentially omniscient, then the closest worlds
must be ones in which the past is different because there simply are
no worlds in which God holds false beliefs. Unfortunately, as a non-
theist, Lewis never considers the exception which the God of bibli-
cal theism would constitute to his strictures against the past's being
counterfactually open.

Analyses of counterfactuals and subjunctive conditionals which do
not invoke Lewis's possible worlds semantics are no more inimical to
back-tracking counterfactuals than Lewis's approach. On a *conse-
quentialist* analysis, the state of affairs described by the consequent is
held to be a consequence of the state of affairs described by the an-
tecedent. Obviously, the notion of "consequence" must have a great
deal of latitude on this account, and there is no reason a chronologi-
cally prior state of affairs might not be a consequence of a posterior
state of affairs. Indeed, on a consequentialist account, Lewis's state-
ment "The past would be the same, however we acted" would entail
that the past *is* a consequence of how we act. Far from barring the
counterfactual dependence of God's foreknowledge on the future, the
consequentialist account would seem to allow anything past to depend
counterfactually on the present. On a *meta-linguistic analysis*, some
consequential relationship holds between the antecedent and conse-
quent in that either the antecedent entails the consequent or there is
some set of true propositions which are co-tenable with the antecedent
and whose conjunction with the antecedent entails the consequent.
Again, given the conjunction of an antecedent expressing some coun-
terfact about the future and of a set of propositions asserting the
existence of an essentially omniscient being and the validity of Bi-
valence for future-tense propositions, the consequent is entailed that
this being would have known differently than he knew. There seems

little danger that any non-question-begging criterion of cotenability could be devised that would preclude the conjunction of such an antecedent with such a set of propositions. On a *condensed argument* analysis, counterfactuals are neither true nor false, for they do not express propositions, but are really arguments with omitted premises. But once more, given premises asserting God's omniscience and Bivalence for future-tense propositions, the consequent follows from the antecedent in a counterfactual concerning God's foreknowledge, so that the counterfactual condenses a logically valid argument. On a *suppositional* analysis, one supposes some possibility to be realized and associates with it how things would be by envisaging the possibilities and consequences in question. Proponents of this analysis may claim that conditionals with unfulfilled antecedents are not susceptible of truth or falsehood unless the antecedent entails the consequent or its denial. Without caring to dispute this claim, the defender of foreknowledge may simply point out that an antecedent about some future event when entertained as a supposition along with that of an essentially omniscient God does indeed entail the consequent that this God would foreknow the facts envisaged in the antecedent. What cannot be envisaged is that an essentially omniscient God should exist and that He should err concerning the actualization of some future possibility. Hence, it seems that whichever of the principal analyses of counterfactuals one prefers, there is no reason to deny the legitimacy of back-tracking counterfactuals in which the antecedent concerns a future state of affairs and the consequent a past state of affairs conditioned by that of the antecedent.

### Plantinga's Path of Profound Perplexities

The source, then, of our intuitions concerning the necessity and unalterability of the past over against the future is not the counterfactual closedness of the past as opposed to the future, but rather the causal closedness of the past as opposed to the future. In what is perhaps the most intriguing section of his paper, Plantinga seems to be groping for a similar solution. Having laid out his understanding of temporal or accidental necessity as exposited above, he muses,

> Accidental necessity as thus explained, however, does little to help explain our deep intuitive beliefs about the asymmetry of past and future—the fact that the future is within our control in a way in which the past is not; far too few propositions turn out to be accidentally necessary. What is the root of those beliefs and what is the relevant asymmetry between past and future? Perhaps it's just that the scope of our power with respect to the past is vastly more limited than that of our power with

respect to the future; while it is *possible* that there is something I can do such that if I were to do it, then Abraham would not have existed, this is extremely unlikely; and there are many propositions about the future such that whether or not they are true depends on what I do. I don't think this is an important part of the story, however, simply because we really know very little about how far our power with respect to either past or future extends. With very few exceptions, I do not know which true propositions about the past are such that I can so act that they would have been false; and the same goes for true propositions about the future.

So suppose we look in a different direction. Possibly there is something I can do such that if I were to do it, then Abraham would not have existed; but it is not possible—is it?—that I now cause Abraham not to have existed . . . . Perhaps we could say that a true proposition about the past is accidentally necessary in a new sense if and only if it is not now possibly within anyone's power—not even God's— to cause that proposition to be false; and perhaps we could then see the relevant asymmetry between past and future as the fact that true propositions strictly about the past— unlike their counterparts about the future—are accidentally necessary in this new sense.

Perhaps the right answer lies in this direction; but the suggestion involves a number of profound perplexities—about agent causation, the analysis of causation, whether backwards causation is possible, the relation between causation and counterfactuals—that I cannot here examine. [35]

Plantinga continues instead down the path which his original definition had set for him; but I think that in the above remarks we see more clearly the correct way to follow. In the first paragraph of the above citation, Plantinga admits that his definition of temporal necessity fails to account for our intuitions of the past's necessity. The explanation he then dismisses I take to be that our intuitions about the past's necessity are due to the relatively limited number of *de facto* counterfactually dependent relations between past and future events. Although he is doubtless correct that our ignorance of such *de facto* relations precludes their being the source of our intuitions of the necessity of the past, still such relations do furnish a better account of the difference between hard and soft facts about the past and, hence, of temporal necessity than does Plantinga's own account. The past is *de facto* harder than Plantinga's original definition will allow, but our ignorance of the relevant counterfactual relations makes it extremely dubious that our sense of the past's necessity is generated by the scarcity of such relations. Oddly enough, then, it seems that the philosophical notion of temporal necessity has little to do with our intuitions of the past's necessity. In the second paragraph of the above citation, Plantinga maps out the better way, albeit with dangerous ambiguity. His language could be taken to mean that the

necessity of the past consists in the unalterability of the past, since he speaks of the impossibility of anyone's making a true proposition about the past to be false. But Plantinga intends the past to be necessary in a way the future is not, and he himself had argued earlier that the future is as unalterable as the past. Rather his meaning here is that a true proposition about the past is temporally necessary iff one cannot causally affect the past such that the proposition would have been false. Now as a *definition* of temporal necessity, Plantinga's suggestion is again misguided, for some actualities of the past are counterfactually dependent upon actualities of the future without being thereby caused by those future actualities. But presumably the question at issue is not the definition of temporal necessity, but rather, what accounts for our deep-seated intuitions about the necessity of the past and the contingency of the future. Here Plantinga is on target: because backward causation is impossible, we can causally determine only the present and future, hence spawning our sense of the past's necessity and the openness of the future. Ironically, were we not so ignorant of how we counterfactually condition the past, perhaps we should not have so strong intuitions about the necessity of the past. For who cares, after all, about rendering it such that Caesar died 2009 years before one writes an article or even that God believed *p* instead of *q*? Counterfactual conditioning of the past becomes a vital concern only when confronted with something like a choice involving retroactive prayer or a Newcomb's Paradox (see next chapter). But rarely are we ever consciously confronted with such situations, especially if we are non-theists. The choices with which life confronts us are causal in nature, and the fact that we cannot cause things to have happened in the past has led us to think of the past as necessary and unalterable.[36] Unfortunately, Plantinga, citing in his third paragraph the perplexing profundities of this explanation, declines to take this route.

## Fatalism and Ability

### Temporal Necessity and Entailment

Now the theological fatalist claims, not merely that certain past and present events or actualities are hard facts, but also that future events or actualities may also be hard facts because they are entailed by hard facts of the past or present. Hence, a proposition about some future contingency is temporally necessary if it is entailed by a temporally necessary past- or present-tense proposition: $\Box p; \Box (p \supset q); \vdash \Box q$. But what can it mean to say that a future event or actuality is a hard fact

or that a future contingent proposition is temporally necessary? As I have defined these notions, such expressions are nonsensical. Perhaps we could say that a future event or actuality is hard iff it is counterfactually independent of any prior event or actuality. A future fact would be soft if it is counterfactually dependent on prior events or actualities. A future-tense proposition is temporally necessary iff it expresses a hard fact and temporally contingent iff it expresses a soft fact. But obviously, these characterizations would be wholly unacceptable to the theological fatalist. For fatalists do not deny that the future would be different if some prior event or actuality were different, but they insist that given the prior event or actuality it cannot be different. Moreover, on the above characterization, relatively few events of the future would seem to be hard, since most future events are counterfactually dependent upon prior events or actualities.

The inevitable question which arises as a result of these considerations is one to which contemporary literature has given virtually no attention, namely, is temporal necessity closed under entailment? That is to say, is a proposition which is entailed by a temporally necessary proposition also itself temporally necessary? Molina, for one, denied that this is the case.[37] He held to a view of temporal necessity as strong as that of any fatalist, maintaining that if God believed $p$, there is no longer any possibility in either the divided or composite sense of God's believing $\sim p$; nevertheless, he held that it is within a free agent's power to bring it about that $\sim p$. The basis for this apparently incongruous position is Molina's conviction that although God's believing $p$ is now necessary and entails $p$, temporal necessity is not closed under entailment, so that $p$ remains temporally contingent until the appropriate state of affairs described by $p$ is actualized.

Molina's modern translator and commentator, Freddoso, confesses to astonishment at Molina's move because Freddoso's own definition of temporal necessity, given in (12) above, is closed under entailment.[38] Molina must therefore be working with a different conception of temporal necessity than Freddoso's. Noting that what Molina opposes is not the Ockhamist distinction between hard and soft facts about the past, but rather the claim that agents have causal power over the past, Freddoso proposes the following as a Molinist definition of temporal necessity:

> 12*. $p$ is temporally necessary at $t$ iff (i) $p$ is metaphysically contingent and (ii) $p$ is true at $t$ and (iii) for any possible world $w$ such that $w$ shares the same causal history with our world at $t$, no agent has the power at or after $t$ in $w$ to contribute causally to $p$'s not being true.

In short, on this interpretation Molina is proposing an analysis of temporal necessity in terms of the impossibility of contingent backward causation. Such a definition is appealing, since we have seen that our intuitions of the past's necessity spring precisely out of our inability to causally affect the past. Molina's account has the advantage of not divorcing the necessity of the past from the source of our intuitions about it. Of course, he must also then presuppose the metaphysical impossibility of time travel, backward causation, and the like, and it is interesting that he does so on the same grounds that I have, namely, the A-theoretic nature of time.[39] His definition says nothing against non-causal accounts of precognition or divine foreknowledge. Molina will still agree with the Ockhamist that were I to do differently, God would have foreknown differently. Freddoso acknowledges that for the Molinist "genuine causal contribution is always future-oriented, whereas mere counterfactual dependence may . . . be past-oriented or backtracking."[40] Hence, God's foreknowledge is still a soft fact about the past, though it is now causally inaccessible. Similarly, Freddoso recognizes that on the Molinist account, there may be degrees of counterfactual dependence, God's middle knowledge being *directly* counterfactually dependent upon the course of future events and other past events being *indirectly* dependent upon future events, based on whether God would have acted differently if He had had different middle knowledge than He did. But the salient point is that temporal necessity as defined in (12*) is not closed under entailment. Given that some event is causally contingent, it can or can not occur regardless of whether God's foreknowledge of it is now causally closed off because it is not linked causally to God's foreknowledge of it. Therefore, even though God's foreknowledge is temporally necessary and entails the occurrence of some future event, that event is not itself temporally necessary.

Freddoso declares his conversion from his earlier Ockhamist definition to a Molinist conception of temporal necessity because the latter handles the problem of the reliability of prophecy more effectively.[41] Molina argued that if Ockhamism were correct, then even though a prophecy of a future contingent event had been given, it is still possible that free agents might at a later time fail to do what was prophesied, so that God at that later time then causes the prophecy never to have been given; but this, he charged, undermines any confidence we might have in the reliability of divine prophecy. Thus, Ockhamism, in Freddoso's words, commits one to claiming either that God can "undo the causal history of the world" or that divine prophecies "might be deceptive or mistaken."[42] By contrast, on Molina's view, no agent can

causally undo the past, so that we can have absolute confidence that
what has been prophesied will come to pass. But Freddoso surely
knows better than to think that Molina's characterization of Ock-
hamism as retrocausal in nature is accurate with regard to Ockham
himself.[43] The temporal contingency of God's foreknowledge (and,
hence, of prophecy) is counterfactual, not causal, in nature. Once a
prophecy has been given, we can be absolutely certain that it will
come to pass. To allege that God might "undo" the causal history of
the world is to relapse into thinking that one's ability to act such that
the past would have been different means the ability to change the
past, which it does not. Ockham's view is that, though the prophecy
has been given, if the relevant person were to refrain from doing what
was prophesied, then God would have foreknown this fact and never
given the prophecy in the first place. On Molina's view, moreover,
the prophecy is as soft a fact as on Ockham's view, for if some agent
were to refrain from performing the prophesied action (as he is free to
do), God via His middle knowledge would have known that he would
refrain in such circumstances and so He would never have given the
prophecy. On either view, our certainty that the prophesied event
will occur is equal to our certainty that the prophecy has been given.
The only difference between them is that Ockham takes God's sim-
ple foreknowledge to be directly counterfactually dependent on future
events, whereas Molina makes it indirectly dependent by interposing
divine middle knowledge.

According to my own analysis, it would seem unintelligible or inap-
propriate to speak of future-tense propositions as temporally neces-
sary. Since temporal necessity is restricted to past- and present-tense
propositions, it cannot on my account be said to be closed under
entailment. On other accounts of temporal necessity, however, it is
not unintelligible or inappropriate to ascribe temporal necessity to
future-tense propositions: for example, Plantinga's definition of tem-
poral necessity in terms of the power of agents allows future-tense
propositions to be temporally necessary. For while the fatalist would
agree that the condition

> (ii) necessarily, if $S$ were to perform $A$ at $t$ or later, then $p$ would
> be false

is met when $p$ is a future-tense proposition, he would deny that con-
dition

> (i) $S$ has the power at $t$ or later to perform $A$

is met. That is to say, he admits, for example, that were Jones to
commit suicide at $t_1$ then it would be false that he would mow the

lawn at $t_2$, but the fatalist contends that Jones does not in fact have the power at $t_1$ to commit suicide because God believed at $t_{n<1}$ that Jones would mow his lawn. Therefore, it is temporally necessary that Jones mow the lawn at $t_2$.

But even if my foregoing analysis of temporal necessity is incorrect and we concede to the theological fatalist the intelligibility and appropriateness of future-tense propositions' being temporally necessary, it is not clear that temporal necessity is closed under entailment. The stronger the notion of temporal necessity, the more plausible it is that temporal necessity is not closed under entailment. Plantinga's notion of temporal necessity is too weak for the fatalist's purposes, since under it God's past beliefs are not temporally necessary. But if we somehow strengthen temporal necessity in such a way as to make God's past beliefs necessary, then, to my mind at least, it becomes clear that we must adopt a notion of temporal necessity which is not closed under entailment. For we have seen that fatalism appears to be simply incoherent; it posits a constraint upon causally indeterminate events which is altogether mysterious. Therefore, if we concede to the theological fatalist that God's past beliefs, including those about the future, are necessary and we agree that God's believing some future contingent proposition $p$ entails $p$, it follows that unless we are willing to deny *modus ponendo ponens* temporal necessity is not closed under entailment. For the state of affairs described by $p$ is future and contingent and therefore cannot intelligibly be characterized as temporally necessary just in virtue of God's believing $p$ in advance. Since $\square\, p$ cannot thus be validly derived from the two premisses, it is in all probability the case that the temporal necessity of God's belief that $p$ is not mediated to $p$ via entailment.

The theological fatalist thus seems to be encountered with the following dilemma:

35. Either God's belief that $p$ is temporally necessary or not.

36. If not, then $p$ is not temporally necessary (even if temporal necessity is closed under entailment).

37. If so, then $p$ is not temporally necessary (because temporal necessity is not closed under entailment).

38. Therefore, $p$ is not temporally necessary.

On weak views of temporal necessity such as Freddoso's or Plantinga's, temporal necessity is closed under entailment, but since God's belief that $p$ is not necessary neither is $p$. On the other hand, if some strong notion of temporal necessity such as Molina's be adopted, then

it seems very likely that such necessity is not closed under logical entailment. Either way the fatalistic argument fails.

The point I am making becomes especially evident if we take the temporal necessity of past events or actualities to mean that all such events or actualities are "not within one's power." For we have seen that power is quite definitely not closed under entailment. Thus, one could concede that it is not within one's power to influence God's past belief that $p$ and yet maintain that it is within one's power to bring it about that $\sim p$. One's power to do the latter is so obvious that it seems clear that such a notion of temporal necessity is not closed under entailment.

## Temporal Necessity and Ability

All this brings us back once more to the fatalist's flawed conception of "within one's power." Fatalists are often prone to speak of temporal necessity, whether of past- or future-tense propositions, in dispositional terms like "unalterability" or "unpreventability." But to say a definite temporally indexed proposition, like "Jones will mow the lawn at $t_2$," is unalterably true is entirely trivial, since it is logically impossible for the same proposition to be successively true and false except insofar as this is wrought by tense changes. But the tenseless version, whether about events transpired or yet to come, is unalterably true and yet in no way conflicts with one's ability to act such that it would be false. As for unpreventability, it is tautologous to say a past event is unpreventable, since the notion of prevention entails that the envisioned object of action is yet future. But why can a past event not be postvented in the same sense that a future event might be prevented? Not that one has the power to act such that an event which happened did not happen or an event which will happen will not happen; rather one can act such that the events would not have happened which did happen or would not happen which will happen.

Mavrodes has argued incisively that the theological fatalist has been deceived by what he calls "vestigial modalities."[44] Those who adhere to the necessity of the past often make assertions like

> 39. She got married last week, so her father cannot do anything now to prevent her marriage.

Mavrodes contends that the "cannot" here is not really about what is within the father's power, but is a vestigial modality. In order to show this, he considers

40. The County Clerk has no record of them, so they could not have been married here.

Now (40) is an enthymeme, the suppressed premiss being

41. It is not possible that (both) the County Clerk has no record of them and they were married here.

The argument concludes from (41) and

42. The County Clerk has no record of them

that

43. They could not have been married here.

The form of the argument seems to be $\sim \diamond (p \cdot q)$, $p$, $\vdash \sim \diamond q$—which is invalid. But Mavrodes maintains that the modalized conclusion is merely a rhetorical flourish of natural language. The real argument concludes from (41) and (42) that

44. They were not married here

—which is valid. Why then does the modal term appear in (40)? Mavrodes replies that it is a shadow of the genuine modality in (41), and its function is to record and recall the modality of the suppressed premiss. Thus, like a vestigial organ which has no present use but represents the evolutionary history of an organism, so the "could not" in (40) is a vestigial modality. But the same is true of (39). It is an enthymematic expression of the inference from

45. It is not possible that (both) she got married and her father will now do something which prevents her marriage

and

46. She got married last week

to

47. Her father will not now do anything to prevent her marriage.

Hence, propositions like (39) are quite neutral with regard to the question of whether anything can be done now to postvent a past event.

The application to the problem of theological fatalism is obvious.[45] When the fatalist says that

48. God believed at $t_1$ that Jones would do $x$ at $t_2$, so it is not within Jones's power to refrain from $x$ at $t_2$

the notion of "not within one's power" is a vestigial modality left over from the suppressed premiss

49. It is not possible that (both) God believed at $t_1$ that Jones would do $x$ at $t_2$ and Jones refrains from $x$ at $t_2$.

Worse than that, the original logical modality in becoming vestigial
has been recast in terms of personal power, with all its disastrous con-
sequences. There seems to be no warrant for thinking that we cannot
by our actions postvent beliefs entertained by God. Unfortunately,
theological fatalists typically misunderstand this to mean ability to
change the past. Hasker, for example, in response to Mavrodes, be-
lieves that the father's power to prevent his daughter's past marriage

> . . . is power to prevent a past event *that has already occurred.* It is
> one thing for the father to say: 'My daughter did not get married, and
> the reason she did not is something I am going to do right now.' It is
> quite another thing for him to say, 'My daughter got married, all right,
> but I can still, if I want to, prevent her marriage.' In this latter case, we
> must understand the father as claiming to be able to *expunge* or delete
> his daughter's marriage from the past of our world . . . . He claims the
> power to bring it about that, whereas it is now true that his daughter
> has been married, in the future, after his preventing action, it will no
> longer be true that his daughter has been married.[46]

In his reply, Mavrodes of course denied that he asserted any power
to expunge or delete events from the past.[47] His claim is that al-
though the wedding has occurred, it may still be within one's power
to act such that, had he so acted, the wedding which did take place
would not have taken place. Hasker, however, still failed to see the
point: hoping to reformulate Mavrodes's argument to the fatalist's
own advantage, he contends:[48]

> 50. It is now unalterably the case that she got married last week.
>
> 51. It is not possible that (both) she got married last week and
> her father will now do something which prevents her marriage.
>
> 52. Therefore, it is now unalterably the case that her father will
> not do anything which prevents her marriage.

But in so doing, he gives away his case: for Mavrodes is perfectly
content to accept (50-52), since, as we have seen, unalterability has
nothing to do with freedom or power.[49]

Not that vestigial modality alone suffices to explain our intuitions
of the past's necessity—for we have seen that what one is able to
do to determine the past depends on what *de facto* counterfactual
relations exist between past and future. It may be the case that if
God foreknew that the father would do $x$, He would not allow the
marriage to occur. In such a case, Mavrodes's analysis gives a proper
account. But suppose there is no action which the father might take
such that God would have prevented the marriage. In that case, given
the impossibility of backward causation, to say "Her father cannot do
anything now to prevent her marriage" is entirely correct and not an
expression of a vestigial modality. But in this case, the reason he

cannot do anything to postvent the marriage has nothing to do with the simple pastness of the marriage; rather it is due to the *de facto* absence of any counterfactual dependence of the past fact in question on any action he might take in the future which would be a condition of the past event.

## *Conclusion*

In conclusion, then, the notion of temporal necessity is certainly queer and perhaps a misnomer. It really has little to do with temporality *per se* and everything to do with counterfactual openness or closedness. We have seen that the future is as unalterable as the past, but that this purely logical truth is not antithetical to freedom or contingency. Moreover, we have found that certain past facts are counterfactually open in that were future events or actualities to be other than they will be, these past facts would have been different as a consequence. God's beliefs about the future are such past facts. Moreover, the effects of actions which God would have taken had He believed differently are also such past facts. Oddly enough, then, virtually any past fact is potentially counterfactually open, and the only necessity that remains is purely *de facto*. We, of course, do not in general know which events of the past depend counterfactually on present actions, and those cases we do know about seem rather trivial. Our intuitions of the necessity, unalterability, and unpreventability of the past as opposed to the future stem from the impossibility of backward causation, which is precluded by the dynamic nature of time and becoming. But the counterfactual dependence of God's beliefs on future events or actualities is not a case of backward causation: rather future-tense propositions are true in virtue of what will happen, given a view of truth as correspondence, and God simply has the essential property of knowing all and only true propositions. Propositions become temporally necessary when all the opportunities to affect things counterfactually have slipped by. Hence, the mere fact that an event is past is no indication that it is counterfactually closed. This is especially evident in the case of God's foreknowledge. If we say that God foreknows that I shall do $x$ and therefore I cannot refrain from doing $x$, lest I change God's past foreknowledge, we are being deceived by a modality which has nothing to do with my power or freedom. All that is impossible is the conjunction of God's foreknowledge that $p$ and of $\sim p$; but this modality *in sensu composito* has no bearing on my ability to act such that $\sim p$ would be true, with the result that God would have foreknown differently. If we insist on a stronger sense

of temporal necessity, then it becomes plausible to hold that such a necessity is not closed under entailment. Temporal necessity, then, turns out to be only obliquely temporal and modally weak, certainly no threat to freedom or divine foreknowledge.

## NEWCOMB'S PARADOX

Undoubtedly the most provocative and elucidating illustration of the problem of theological fatalism is what has come to be known as Newcomb's Paradox. Originally the brain child of William Newcomb of the University of California's Lawrence Livermore Laboratory, this puzzle was passed on to the philosophical public by Robert Nozick in 1969 and has generated such debate that one recent disputant speaks of current philosophy's "Newcombmania."[1]

### *The Puzzle Conditions*

According to Nozick's account, we are to imagine a being in whose predictive powers we have enormous confidence; indeed, this being has never made an incorrect prediction of one's choices. Suppose then that we are confronted with two boxes, $B_1$ and $B_2$ . $B_1$ contains $1,000; $B_2$ may contain either $1,000,000 or nothing at all. We are given the option of taking the contents either of $B_2$ alone or of $B_1$ and $B_2$ together. Suppose furthermore, that the following are true:

> 1. If the being predicts that you will take what is in $B_1$ and $B_2$, he does not put the $1,000,000 in $B_2$.

> 2. If the being predicts that you will take only what is in $B_2$, he puts the $1,000,000 in $B_2$.

Nozick further stipulates that if one randomizes his choice, then the being does not put the $1,000,000 in $B_2$.

Now what is one to do? There are two "plausible looking and highly intuitive arguments" which require different decisions[2]. According to the first argument, one reasons: If I take what is in both boxes, the being will almost certainly have predicted this and left $B_2$ empty. On the other hand, if I take $B_2$ alone, he will have put the $1,000,000 in it. So I shall take $B_2$ alone. According to the second argument, one reasons: The $1,000,000 is already sitting in $B_2$ or it is not, and which situation obtains is already fixed and determined. If the being has already put $1,000,000 in $B_2$ and I choose both, then I get $1,001,000. If he has not, then I get $1,000. Either way I get $1,000 more than by taking $B_2$ alone.

Nozick seeks to augment the force of each argument by means of the following further stipulations: With regard to the first argument, sup-

pose that all previous people who chose $B_2$ alone got the $1,000,000. All the "shrewdies" who followed the recommendation of the second argument wound up with only $1,000. It would be rational for a third person to bet, giving high odds, that if you take both boxes, you will get only $1,000. In fact, if the award of the money were delayed, even you ought to offer such a bet! With regard to the second argument, suppose that $B_1$ is transparent so that you can see the $1,000 sitting there. The $1,000,000 is already either in $B_2$ or not. "Are you going to take only what is in $B_2$ ?" asks Nozick. Suppose, furthermore, that $B_2$ has a transparent side facing a third person, who can therefore plainly see whether $B_2$ is empty or not. The money is not going to appear or disappear. "Are you going to take what is only in the second box, passing up the additional $1,000 which you can plainly see?" Nozick demands. Moreover, whatever the state of $B_2$, this third person is hoping that you will take both boxes, and you know that he must be so hoping. "Are you going to take only what is in the second box," asks Nozick incredulously, "passing up the additional $1,000 which you can plainly see and ignoring my internally given hope that you take both?"[3] In the face of these two arguments, what should one do?

## Theological Implications

Nozick originally presented the paradox as a dilemma within the realm of decision theory, but it is of obvious interest for the metaphysician and philosopher of religion as well. For it is almost irresistible to identify Nozick's "being" with an omniscient God and to construe Newcomb's Paradox as an illustration of the problem of theological fatalism. In a later piece Nozick himself approves of the identification of the Being (now capitalized) with God.[4] Bar-Hillel and Margalit make the connection with fatalism when they assert that if such a Being existed, then he would contribute just the kind of evidence that would disprove one's illusion that he can choose arbitrarily between the boxes—". . . the facts really imply that there is no free choice, but the illusion of free choice remains, and one has to behave as if free choice exists."[5] Similarly Don Locke: ". . . once the Predictor has made his prediction, that prediction becomes fixed and unalterable: having made the one prediction, it is no longer possible for him to make the other. So given that the Predictor is absolutely infallible, it is at the time of choosing equally impossible, and in just the same sense, for the Chooser to make any choice other than that predicted."[6] According to Locke, the fact that the Predictor will no

doubt have correctly predicted my choice as he has all others' " . . . gives me every reason to think that I have no choice in the matter at all, or that if I do have any freedom, it is a freedom I am unlikely to exercise."[7] Schlesinger, on the other hand, thinks that the fatalistic implications of Newcomb's Paradox succeed in showing that an infallible and omniscient Predictor cannot exist.[8] Similarly, an exultant Isaac Asimov proclaims:

> I would, without hesitation, take both boxes . . . I am myself a determinist, but it is perfectly clear to me that any human being worthy of being considered a human being (including most certainly myself) would prefer free will, if such a thing could exist . . . . Now, then, suppose you take both boxes and it turns out (as it almost certainly will) that God has foreseen this and placed nothing in the second box. You will then, at least, have expressed your willingness to gamble on his non-omniscience and on your own free will and will have willingly given up a million dollars for the sake of that willingness—itself a snap of the finger in the face of the Almighty and a vote, however futile, for free will . . . . And, of course, if God has muffed and left a million dollars in the box, then not only will you have gained that million, but *far more important* you will have demonstrated God's non-omniscience.[9]

Unwilling to abandon either divine foreknowledge or human freedom, Dennis Ahern concludes from his analysis of Newcomb's Paradox that the problem of foreknowledge and freedom remains an unresolved paradox. For it is equally implausible to believe either

> 3. One has control over God's past beliefs without recourse to the objectionable notion of backward causation

or

> 4. An action otherwise free becomes not free simply because it is foreknown or predicted.

But the falsity of (3) implies the truth of (4) and the falsity of (4) implies the truth of (3). Thus, if infallible foreknowledge existed, ". . . we should have sound reasons for believing it would not have a bearing on whether an action was performed freely and there would be no freedom of action."[10]

What may be said to this purported challenge of Newcomb's Paradox to divine foreknowledge or human freedom? To begin with, it seems that we can safely dismiss Ahern's middle way between the dilemma's horns. For what Ahern has left us with is not a paradox, but an antinomy. If correct, his reasoning has demonstrated that the assumption of divine foreknowledge entails contradictory propositions concerning the freedom of foreknown actions. Therefore, the initial assumption which generated the antinomy must be rejected. Accordingly, Ahern should side with Schlesinger and Asimov in rejecting

divine omniscience.

The alleged alternatives, then, with which Newcomb's Paradox confronts us are a denial of divine foreknowledge or a denial of human freedom. The incompatibility of these two assumptions is thought to be demonstrated by the fatalism implicit in the Newcomb game. The issue, therefore, is whether Newcomb's Paradox entails fatalism.

## Nozick's Dilemma

Perhaps the best way to get at this issue is to return to the original dilemma posed by Nozick for decision theory. According to the *Expected Utility Principle*, among those actions available to a person, he should perform that action with maximal expected utility. According to the *Dominance Principle*, if there is a partition of states of the world such that relative to it action *a* weakly dominates action *b*, then *a* should be performed rather than *b*. Now these two principles seem to come into conflict in Newcomb's Paradox. We may construct the following pay-off matrix for the Expected Utility Principle:

|  |  | Being | |
| --- | --- | --- | --- |
|  |  | A:<br>predicts<br>agent will<br>take $B_2$ alone | B:<br>predicts<br>agent will<br>take $B_1$ & $B_2$ |
| Agent: | i. takes $B_2$ alone | \$ 1,000,000 | \$ 0 |
|  | ii. takes $B_1$ & $B_2$ | \$ 1,001,000 | \$ 1,000 |

According to this principle, we may calculate the expected utility of the agent's respective actions by multiplying each of its mutually exclusive outcomes by the probability of each state's obtaining and adding these products together. Given a probability of .9 for the Being's prediction's being accurate, the expected utility of action (i) is (.9 x \$1,000,000) + (.1 x \$0) = \$900,000. The expected utility of action (ii) is (.1 x \$1,001,000) + (.9 x \$1,000) = \$101,000. On this principle, one should choose to do (i). But according to the Dominance Principle, if the world is divided into various states and some action *a* is best in one state and at least equal in all the others, one should choose to perform *a*. But in this case we have such a partition of the world into states *A* and *B*, determined by the Being's predictions. Here action (ii) is strongly dominant, for in either case

one acquires $1,000 more than he would by performing action (i). So one ought to take both boxes.

Now it is often pointed out, for example by Cargile, Olin, and others, that for the Dominance Principle to be valid, the states of the world must be causally and probabilistically independent of the actions to be taken.[11] That is to say, if performing action (ii) in some way brings about or renders more probable state B, for example, the the principle no longer applies. States A and B are probabilistically independent of actions (i) and (ii) if the probability of A given that (i) is taken is the same as the probability of A given that (ii) is taken, and likewise for B. In the Newcomb situation, however, the probability of A or B's obtaining is not probabilistically independent of whether the agent chooses (i) or (ii). Therefore, the dominance argument fails.

But Nozick is ready with a response.[12] He furnishes the following example of a situation in which the states are not probabilistically independent of the actions and yet the Principle of Dominance clearly applies. Suppose person $P$ knows that either person $S$ or $T$ was his father. $S$ had a fatal hereditary disease, but $T$ did not. If $S$ was $P$'s father, then $P$ will also die of this disease; if $T$, then he will not. Now this disease makes one intellectually inclined. $P$ is deciding whether to go on to graduate school or become a baseball player, and he slightly prefers the academic life. Let $w = P$ is briefly an academic and then dies; $x = P$ is an academic and normal; $y = P$ is briefly an athlete and then dies; $z = P$ is an athlete and normal. Accordingly we can construct the following matrix, assigning preference values to $w$, $x$, $y$, $z$.

<div align="center">Father</div>

|  | A:<br>$S$ is $P$'s father | B:<br>$T$ is $P$'s father |
|---|---|---|
| Son:   i. goes to grad school | $w$ (-20) | $x$ (100) |
| ii. plays baseball | $y$ (-25) | $z$ (95) |

The Dominance Principle tells $P$ to choose (i). But in that case, he probably has the disease. So the Principle of Expected Utility would advise him to choose (ii). But this latter recommendation, says Nozick, is "perfectly wild." The probabilities favor (ii), but which state obtains is already fixed and determined and does not depend on $P$'s action. By choosing (ii), $P$ does not make it less likely that $S$ is his father nor make it less likely that he will die of the disease. Thus, ". . . in situations in which the states, though not probabilistically

independent of the actions, are already fixed and determined, where actions do not affect whether or not the states obtain, then it seems that is legitimate to use the dominance principle . . . "[13] Yet even then it is not so much the fact that the states are fixed and determined that is critical, he adds, but whether one's actions affect which one is actual. For in the Newcomb situation, the prediction could be made and the choice taken and only then the money placed in the boxes on the basis of the prediction. "This suggests that the crucial fact is not whether the states are already fixed and determined, but whether the actions *influence* or *affect* which state obtains."[14] Where such influence exists, one should always maximize utility.

### Divine Foreknowledge and the One-Box Strategy

Now in the conditions originally laid down in Newcomb's Paradox, no such influence exists. That is to say, contrary to the impression given by several writers, the being of Newcomb's Paradox did not make his predictions on the basis of precognition. On Nozick's formulation, Newcomb's Paradox is analogous to the situation described in the case of $P$'s deciding to study or play sport. The decision is wholly independent of the state which obtains. But once the Being is identified with God, the picture changes radically: for God's prediction is based on precognition of the decision, or in the language of theology, foreknowledge. In this case the actions and the states are not independent, for God predicts what He knows one will do. Hence, Nozick admits, ". . . if one believes that the way the predictor works is by looking into the future; he, in some sense, sees what you are doing, and hence is no more likely to be wrong about what you do than someone else who is standing there at the time and watching you, and would normally see you, say, open only one box, then there is no problem. You take only what is in the second box."[15] In fact, as Plantinga observes,[16] in the case of divine foreknowledge there is a logically demonstrative argument for the one box strategy of the form A □→ B; (A & B) □→ C; therefore A □→ C:

>    5. If one were to take $B_1$ and $B_2$ , then God would have believed that one would take $B_1$ and $B_2$.

>    6. If one were to take $B_1$ and $B_2$ and God believed that one would take $B_1$ and $B_2$, then God would have put nothing in $B_2$.

>    7. If one were to take $B_1$ and $B_2$, then God would have put nothing in $B_2$.

A parallel argument proves that if one were to choose $B_2$ alone, God would have put \$1,000,000 in $B_2$. Thus, given the puzzle conditions, the only rational choice is to choose $B_2$ alone.

### Objections to the One-Box Strategy

#### Backward Causation

Now several philosophers, such as Mackie and others, have objected that such an account of the Being's predictive ability entails the dubious thesis of backward causation.[17] According to Mackie, taking only one box would be justified if there occurs an extreme form of backward causation according to which the causal lines are drawn backward in time from the choice to the prediction and then forward from the prediction to the placing of the contents in the box. This analysis, however, seems to rest upon a misunderstanding in which the causal relation between an event or thing and its effect is conflated with the semantic relation between a true proposition and its corresponding state of affairs. For if at $t_n$ I choose $B_2$ alone, then the proposition "$W$ chooses $B_2$ alone" is true at $t_n$ because of the semantic relation which obtains between a true proposition and the corresponding state of affairs which makes it true; by the same token "$W$ will choose $B_2$ alone" is true prior to $t_n$, "$W$ chose $B_2$ alone" is true subsequent to $t_n$, and "$W$ chooses $B_2$ alone at $t_n$" is omnitemporally true. The relation obtaining between a true proposition and its corresponding state of affairs is semantic, not causal. Now God, knowing all true propositions, therefore knows the true future contingent proposition concerning my choice of the boxes. Again no causal relation obtains here. Hence, the charge of backward causation seems entirely misconceived: we have simply the semantic relation between true propositions and their corresponding states of affairs and the divine property of knowing all true propositions. Nozick remarks that he employed terms such as "influence," "affect," and so forth, without paying much attention to technical precision.[18] Now we can see more clearly that in the case of divine foreknowledge the "influence" exercised by the agent's choice over the Being's predictions is not a retro-causal influence, but rather the supplying of the truth conditions for some of the future contingent propositions known by God. Since the Being's predictions are made on the basis of his knowledge of such future contingent propositions, states $A$ and $B$ are not independent of actions (i) and (ii) and therefore the Principle of Dominance is in this case invalid.

Backtracking Counterfactuals

*Objections to Backtracking Counterfactuals*

It may still be objected that such an analysis is counter-intuitive
and paradoxical. It is incredible that something one does now could
affect what God believed in the past such that were one to act differ-
ently God would have believed differently and that given that God
did believe that one will do something one is nonetheless free to do
something else. The problem here lies with (5) and its parallel

> 8. If one were to take $B_2$ alone, then God would have believed
> that one would take $B_2$ alone.

Ahern regards this as paradoxical because in choosing $B_2$ alone one
is giving up, from the perspective of past facts, a sure \$1,000. For in
choosing $B_2$ alone, one knows that there is in fact \$1,001,000 in the
two boxes. Choosing $B_2$ alone is the right strategy, but one must live
with the "uncomfortable knowledge" that at the time of choosing $B_2$
alone God's belief is "unalterably tucked away in the past" and there
is really \$1,001,000 in the boxes.[19] After choosing $B_2$ alone one must
be prepared to say, "If I had chosen both boxes, I would not have got-
ten the \$1,001,000." But an opponent might retort, "Of course you
would have, since it was there! Therefore, you must not have been free
to choose both." This is in fact precisely the reaction of Schlesinger,
who claims that the one box strategy is self-contradictory.[20] He reit-
erates Nozick's argument concerning the well-wisher who can see the
contents of the boxes and sincerely hopes that one will choose both.
If the one box strategy is correct, it is not in my best interests to
follow the advice of a sufficiently intelligent and well-informed well-
wisher. But if a well-wisher is someone who invariably advises me to
do what is in my best interests, then this amounts to saying that it is
not in my best interests to do what is in my best interests, which is
self-contradictory. Moreover, one may argue that the choice of both
boxes is a better choice because the Predictor himself, having sealed
the contents inside, knows the choice of both boxes is superior.[21] He
knows that the chooser cannot place himself in a less favorable po-
sition by choosing both. If asked, "Would the chooser lose anything
should he attempt to choose both?" the Predictor would have to say,
no. He may believe that choosing both "is not open" to the chooser
and assert correctly that "If the agent were to choose both, he would
be better off."

*Backtracking Counterfactuals
and an Inerrant Predictor*

Now if we assume that God's precognitive beliefs are merely inerrant
in the actual world, then the adjudication of this issue will depend on
whether we follow David Lewis in insisting on a standard resolution
of vagueness in comparing the possible worlds in which the various
counterfactuals involved in Newcomb's Paradox are true, or whether
we will allow so-called "back-tracking" counterfactuals in our resolu-
tion of vagueness. According to Lewis's point of view, the standard
method of resolving vagueness in assessing similarity between pos-
sible worlds involves preserving as intact as possible the same past
history in the respective worlds; thus there is a temporal asymmetry
in counterfactual dependence: if the past were different, present or
future events might be otherwise in the closest possible world, but
if the present or future were different, we cannot say that the clos-
est worlds are ones in which past events would be otherwise.[22] Lewis
acknowledges that some contexts may require a special resolution of
vagueness, but he elsewhere makes clear that the Newcomb situation
is not one of them.[23] In that situation backtracking counterfactuals
are not allowed; accordingly it is true that

> 9. If I took only one box, I would be poorer by $1,000 than I
> will be after taking both.

According to Lewis, the "essential element" here is the fact that
whether or not I get the $1,000,000 is causally independent of what I
do now.[24]

Horgan, on the other hand, argues that the Newcomb situation is
precisely one in which a special resolution of vagueness employing
back-tracking counterfactuals should be employed.[25] The one box so-
lution gives top priority to maintaining the Being's accuracy in the
nearest possible world. The closest world in which I take both boxes
instead of one will be a world in which the Being correctly predicted
this and therefore left $B_2$ empty. This means that the past history of
that world will be slightly different than that of the actual world, in
which I choose $B_2$ alone; but it is more important to preserve the Be-
ing's accuracy than a perfect historical match in specifying the closest
possible world. Under the special resolution of vagueness (9) is false;
on the contrary (5) and (8) are true.

Horgan attempts to break the deadlock between these two compet-
ing resolutions of vagueness by arguing that only the special resolu-
tion is pragmatically appropriate in this situation. Given my over-
whelming conviction of the Being's predictive accuracy, I am virtually

certain that the actual world is a world in which the Being has accurately predicted what I shall do. Hence, worlds in which the Being errs ought to be regarded as irrelevant for the purposes of decision-making. Thus, the special resolution is pragmatically appropriate because the closest world in which I do action (i) is one in which $A$ obtains and the closest world in which I do action (ii) is one in which $B$ obtains. No corresponding meta-level argument exists for the standard resolution. All the defender of the standard resolution can do is to appeal again to the intuition that

> 10. *Either* I would get \$1,001,000 if I chose both boxes and I would get \$1,000,000 if I chose $B_2$ alone, *or* I would get \$1,000 if I chose both boxes and I would get \$0 if I chose $B_2$ alone.

But (10) is true only if one already accepts the standard resolution. By contrast, the defender of the special resolution has an independent justification for adopting back-tracking counterfactuals, namely, I am virtually certain, independent of any beliefs I have concerning whether I shall do (i) or (ii), that a world in which the Being errs is not actual. Horgan's defense of back-tracking counterfactuals in this connection would seem all the more conclusive when the Being is God. For now are absolutely certain that the prediction is not in error.

Isaac Levi has, however, objected to Horgan's reasoning,[26] charging that Horgan fallaciously concludes from

> 11. The probability is high that the agent will choose both boxes if the being will so predict

to

> 12. The probability is high that if the agent will choose both boxes, then the being will so predict.

Levi grants that we should choose $B_2$ alone if the probability is high that if the agent will pick both boxes, then the being will predict this. But in the original Newcomb's Paradox, one is not warranted in assuming (12). Hence, Levi has been characterized as a "no-boxer," since on his view the initial conditions laid down in the Newcomb Problem are underdetermined in not specifying whether both sets of conditional probabilities are high, so that neither choice can be judged to be rationally preferable.[27]

In a recent reply to Levi,[28] Horgan concedes that according to the usual formulation of the Paradox it is only laid down that most of the being's two-box predictions have been correct, as have most of his one-box predictions, and that the agent knows this; but that this only shows the probability of a two-box choice is high on a two-box prediction and the probability of a one-box choice is high on a one-box

prediction. Levi is correct that these probabilities can be high even if the converse probabilities are not both high. But Horgan asserts that he construes the Newcomb situation to involve implicitly some further conditions: (i) that almost all of those who have chosen both boxes in the past have received $1,000; (ii) that almost all of those who have chosen only the second box have received $1,000,000; and (iii) that the agent knows these facts. In other words, Horgan takes it to be built into Newcomb's Paradox that for the agent the probability is high that if he chooses $B_2$ the being will have predicted this and the probability is high that if he chooses $B_1$ and $B_2$ the being will have predicted that. This is the reasonable and natural way to construe the problem because only then do the paradoxical conflicts arise. In any event, he concludes, "I suppose there is no prior fact of the matter as to whether the implicit conditions just mentioned are part of Newcomb's Problem or not. Very well, I hereby stipulate that the conditions are included, as I used the term 'Newcomb's Problem'."[29]

Campbell complains that if one makes Horgan's stipulations, then Newcomb's Paradox cannot be used to test one's decision principle; one simply relies on it. The original underdetermined problem is too indeterminate to argue for either decision principle, and if one makes additional stipulations to remove this indeterminacy, he imposes so much structure on the problem that it can no longer serve as an intuitive confirmation of the principle which one favors.[30] But Campbell's dilemma seems dubious to me. In the first place, even if one makes Horgan's stipulations, the success of the one-box argument is going to depend on the cogency of Horgan's meta-level arguments concerning the permissibility of a special resolution of vagueness, and, as we shall see, Horgan himself seems to think there is plenty of room for debate there. (In any case, Campbell's point would not affect the importance of Newcomb's Paradox for the philosopher of religion, as opposed to the decision theorist, for our interest in the problem concerns its implications for theological fatalism.) But, secondly, is it in fact the case that these stipulations were not included in Nozick's original formulation of the problem? A good case can be made that they were. As for conditions (i) and (ii), Nozick explicitly states that the being has never made an incorrect prediction of one's choices. He himself stipulates that all previous people who chose $B_2$ alone got the $1,000,000 and that all the "shrewdies" who chose $B_1$ and $B_2$ wound up with only $1,000. And as for condition (iii), the very puzzle arises because the agent is aware of the being's enormously successful previous track record. Hence, Nozick asserts that it would be rational for the agent himself to offer a bet, giving high odds, that if he takes both boxes he

will get only $1,000. Thus, it would seem that the Newcomb Problem is not underdetermined after all. Of course, no-boxers may find the underdetermined version of the paradox more intriguing (though finally inconclusive), and that is a philosopher's privilege; but he ought not then to claim that he is discussing the genuine Newcomb Problem, for his version would seem to be an attenuation of the original.

Now even given these conditions, the success of the one-box strategy is going to depend on the admissibility of a special resolution of vagueness; for invariant two-boxers like Lewis and Gibbard and Harper insist that the rational choice is to choose both boxes even if one knows that in so choosing he will get only $1,000, since it is also true that is one were to choose only one box, he would be $1,000 poorer than he shall be after choosing both. But Horgan claims to have offered a meta-level argument for preferring a non-standard resolution of vagueness so that the two-boxer's counterfactual claim is false. Eells, has, however, charged that Horgan's argument for a one box choice is as circular as the two-boxer's appeal to (10).[31] For in stating that I am virtually certain, independent of any beliefs I have concerning whether I shall do action (i) or action (ii), that a world in which the being errs is not actual, I presuppose the backtracking resolution of vagueness. For the independence spoken of here must mean that the above outcome is counterfactually independent of whether (i) or (ii) is performed, and I can have such certainty only if a backtracking resolution is presupposed. Hence, the argument begs the question. But Horgan responds that Eells has misconstrued the independence spoken of here.[32] Horgan is not saying that my certainty of getting either $1,000,000 or $1,000 is counterfactually independent of how I choose, but that it is independent of any beliefs I have about how I shall choose; that is to say, the agent in the Newcomb situation has a set of premises which implies that it is highly probable that a world in which one receives $1,000,000 or a world in which one receives $1,000 will become actual, and this set of premises includes no propositions about the probability of one's choosing (i) or the probability of one's choosing (ii). This notion of independence involves no counterfactuals, and so the argument is not circular.

Eells attempts to rehabilitate the two-box argument as well, proposing a new c-resolution of vagueness according to which all the differences between a closest world in which one chooses (ii) and the actual world must be causal results of the occurrence of (ii) in the closest (ii)-type world. Under such a resolution, a one-box strategy would require backward causation. So if we give high priority to avoiding backward causation, the two-box choice is always preferred.[33] But

surely now it is Eells who is making question-begging stipulations. Why should we adopt a $c$-resolution? Why cannot the closest worlds include those with some difference due to a non-causal counterfactual dependence upon an action? Why should we construe counterfactual dependence as causal? Why regard a possible world as the closest (ii)-type world only if I would actualize it (in the causal sense) by choosing (ii), rather than regarding a world as the closest (ii)-type world only if it would be actual were I to choose (ii)? As Horgan notes, Eells's argument is not really a meta-level argument at all, but just another ground level proposal without higher justification.[34]

Nonetheless, Horgan now reluctantly admits that the debate between one-boxers and two-boxers is a "hopeless stalemate."[35] For the two-boxer can consistently refuse to seek a meta-level defense of the standard resolution which does not itself appeal to counterfactuals. The two-boxer need not accept the normative principle that one ought to adopt a meta-level defense which avoids reference to counterfactuals. He can simply cite (10) in support of the standard resolution, concede that his meta-level normative premiss is equivalent to his ground level premiss that one ought to choose both boxes, and then say that he simply regards both these premisses as true.

Now it seems to me that Horgan concedes too much. For he allows the two-boxer to reject the meta-meta-level claim that

> 13. For purposes of choosing a vagueness-resolution to adopt in practical decision making, one ought to act on the basis of a meta-level normative premiss that makes no appeal to counterfactuals; for the question of how to resolve the vagueness of counterfactuals is precisely what is at issue.

But why let the two-boxer get away with this? It seems entirely reasonable and plausible to accept (13), so why should the two-boxer be exempt? Indeed, Horgan himself provides a striking practical incentive for adopting (13) in envisaging a Newcomb situation in which a two-box choice leads to one's death, so that the two-boxer's refusal to accept (13) results in the adoption of a decision principle which proves personally disastrous! Surely this result suggests that (13) is correct, since refusal to accept it as normative may result in adopting a personally injurious decision principle which has no justification beyond itself. If (13) is correct, then the two-boxer's argument is circular.

But even if Horgan is correct in conceding that the justification of the two-box strategy is not viciously circular, that does not therefore mean that the debate is stalemated. For the normative premisses used to justify the two-box choice could be simply false, if not circular. Given the cogency of the meta-level argument for the one-box

strategy, the normative premises of the two-box argument must be false. And Horgan's reasoning in defense of the one-box choice does seem compelling if we reconstruct the payoff matrix used to determine one's choice. For Horgan's analysis closely resembles that of Ferejohn, who argues that in a decision-theoretic context, the payoff matrix ought to be formulated, not in terms of the Being's predicting this or that choice, but in terms of the Being's predictions' being correct or incorrect:

<center>State of Nature</center>

|  |  | A:<br>Being predicts<br>correctly | B:<br>Being predicts<br>incorrectly |
|---|---|:---:|:---:|
| Agent: | i. takes $B_2$ alone | $ 1,000,000 | $ 0 |
|  | ii. takes $B_1$ & $B_2$ | $ 1,000 | $ 1,001,000 |

Here there is no dominant choice for the agent; therefore, he must maximize expected utility. Given one's overwhelming conviction of the Being's correctness, the proper choice is to take $B_2$ alone. Brams points out that this representation of Newcomb's Paradox depends on the assumption that the Being has no control over whether $A$ or $B$ obtains. This is not the same as his being able to correctly predict one's choice, for he almost surely can. Rather (if I understand Brams correctly) it is a matter of whether the Being can control when he is correct; perhaps he just is correct most of the time, but not by his design. It just happens that most of his guesses come out right. In such a case, Ferejohn's matrix is the one to use. On the other hand, if the Being is able to control whether $A$ or $B$ obtains, then one is not playing against a passive state of nature; therefore, Nozick's matrix is correct, with its conflict between the dominance and expected utility principles, though it is incomplete because it assigns no preferences for $A$ or $B$ on the Being's part. Observing that there is nothing in Nozick's original statement of the paradox which suggests that the Being has control over the correctness of his predictions—that is, his predictions are not based on what the agent will do—, Brams asserts that Ferejohn's matrix is appropriate.[36] Horgan's emphasis on preserving the Being's correctness would therefore be justified and the one box strategy vindicated. This defense of the one box strategy does not run afoul of Levi's or Lewis's objection because what the Being predicts does not enter into the matrix. Therefore, the two-box strategy must be rejected. Now if the Being is God, Ferejohn's matrix would be appropriate if we take the predictions to represent

God's true beliefs, for God presumably entertains solely true beliefs by nature, not by choice. On the other hand, in a game situation God could deliberately give false predictions to make things more interesting. In that case, Nozick's original matrix ought to be used. But then surely we would be justified in assuming that the being in Nozick's original paradox was not trying to give false predictions; his preference was to be correct on every try. If this is the case, then in preferring to give correct predictions and being able to control when he does so, God will predict A only when the agent chooses (i) and will predict B only when the agent chooses (ii). Hence, the one box strategy is once again vindicated. Whether we use Ferejohn's matrix or Nozick's, then, a special resolution of vagueness is warranted.

In any case, when the predictor is God, the two-box strategy is plainly the wrong answer, since the agent's choice and God's prediction are not unrelated, as in the original Newcomb Problem, but are related by precognition. The predictions are based on foreknowledge of the choices, and so even invariant two-boxers concerning the original Newcomb's paradox must concede that since, when the predictor is God, the predictions are determined by the choices, a special resolution of vagueness is in order and the rational choice is to choose one box, even though the contents of both boxes are fixed and determined at the time of choosing.

Applying this analysis to Schlesinger's objections, it becomes apparent that his well-wisher was presupposing a standard resolution of vagueness. Had he been sufficiently well-informed, he would have wished that the agent choose $B_2$ alone. Or rather, seeing the money in $B_2$ he would rejoice that his friend is going to choose $B_2$ alone; or seeing no money in $B_2$ he would regret that his friend is about to blunder by choosing both boxes. In a sense, wishing, except in the sense of regret, is inappropriate for the well-wisher since a moment's glance informs him what the future will be, and therefore hoping that one will do something has no place. Schlesinger's Predictor, too, presupposes the standard resolution of vagueness. Otherwise, in answer to the query as to whether the agent would lose something by choosing both boxes, he would reply, "Yes, He would; but he will not choose both and therefore I have sealed up the $1,000,000. If he were to choose both, he would be worse off because I would not have placed $1,000,000 in $B_2$. But happily he will not." In fact, a sufficiently well-informed chooser, were the contents of the boxes exposed also to his view prior to his choice, would realize what his choice will be. Had he resolved to take only one box, he would not upon seeing the contents of both boxes before him suddenly change his mind, tempt-

ing as that might be, for he would know that were he to choose both boxes, it would turn out that the million he had seen was, after all, hallucinatory or in some way unreal.

### Backtracking Counterfactuals and an Essentially Infallible Predictor

If we hold that the predictor is not merely inerrant, but infallible, then in fact no appeal to a special resolution need be made. For most theists hold that God's foreknowledge is not merely inerrant but essentially infallible. Therefore, worlds in which God's prediction errs are not even possible. On this basis the standard resolution alone suffices to ensure a one box choice, for the only possible worlds in which I choose two boxes are worlds in which I get only $1,000. No worlds in which I choose two boxes exist in which the past history of the actual world, in which I choose one box, remains intact. In all worlds in which I choose both boxes, God predicts this and leaves $B_2$ empty. Thus, (5) and (8) are entirely vindicated.

### Newcomb's Paradox and Freedom

But does that mean that in the actual world I am not free to choose otherwise, as Ahern alleges? Are we left with the theological fatalism which prompted our inquiry? By now the answer should be clear. It is I by my freely chosen actions who supply the truth conditions for the future contingent propositions known by God. The semantic relation between a true proposition and the corresponding state of affairs is not only non-causal, but asymmetric. The proposition depends for its truth on which state of affairs obtains, not *vice versa*. Were I to choose otherwise than I shall, different propositions would have been true than are, and God's knowledge would have been different than it is. Given that God foreknows what I shall choose, it only follows that I shall not choose otherwise, not that I can not. The fact that I cannot actualize worlds in which God's prediction errs is no infringement on my freedom, since all this means is that I am not free to actualize worlds in which I both perform some action $a$ and do not perform $a$. The Newcomb Paradox provides no reason for thinking that from

14. There is $1,000,000 in $B_2$ because I am going to choose $B_2$

and

15. Were I going to choose $B_1$ and $B_2$, the $1,000,000 would not be in $B_2$,

it follows that

16. I am not free to choose $B_1$ and $B_2$.

As Cargile puts it, "The player is free—he just cannot escape being 'seen' making his free choice."[37] Admittedly one may feel uncomfortable about the fact that in choosing $B_2$ alone one commits oneself to the existence of \$1,001,000 in the boxes. In this sense, a feeling of strangeness remains. But discomfort is not paradox, nor does a feeling of strangeness warrant a fallacious inference to fatalism.

## Conclusion

Newcomb's Paradox thus serves as an illustrative vindication of the compatibility of divine foreknowledge and human freedom. A proper understanding of the counterfactual conditionals involved enables us to see that the pastness of God's knowledge serves neither to make God's beliefs counterfactually closed nor to rob us of genuine freedom. It is evident that our decisions determine God's past beliefs about those decisions and do so without invoking an objectionable backward causation. It is also clear that in the context of foreknowledge, backtracking counterfactuals are entirely appropriate and that no alteration of the past occurs. With the justification of the one box strategy, the death of theological fatalism seems ensured.

## FOREKNOWLEDGE AND FREEDOM OF GOD

Some thinkers, perhaps sensing the failure of theological fatalism, have attempted to dispute divine foreknowledge by arguing that it is incompatible, not with human freedom, but with divine freedom.

### *Foreknowledge and Human Deliberation*

Richard Taylor's article "Deliberation and Foreknowledge" (1964) appears to have been the recent genesis of this objection. He contends that if God foreknows our future free decisions, then deliberation would be impossible on our part. In analyzing the notion of deliberation, Taylor asserts that one deliberates only about one's own possible future acts. Moreover, if one believes the act is inevitable, one cannot deliberate about it because one deliberates only about what one is able to forego. Finally, one cannot deliberate about what one is going to do while knowing what he is going to do. On this basis, Taylor maintains that if one knows that sufficient conditions exist for doing what he is going to do, then he cannot deliberate about what to do even if he is ignorant of what those conditions are. Thus, if Smith is confronted with a decision and Brown tells him that he knows what Smith is causally determined to do, then if Smith believes Brown he can no longer deliberate about the decision. This leads Taylor into a fatalistic argument: if Smith learns that Brown knows where Smith will be in the future, Smith cannot deliberate about where to be, for Brown's knowledge is a sufficient condition of Smith's being there. "It is not within the power of any man to render false what another man knows to be true."[1]

But this appears to be just the old fatalism in new dress. Since one freely determines where he shall be, he determines which future-tense proposition is true and, hence, what the other fellow foreknows. Were one to act differently, the other would foreknow differently. Oddly enough, Taylor says that we must resist saying that while one could render false what another man knows to be true, no one ever does render false what another knows to be true. "That familiar modal fallacy, taught to all philosophy students early in the game, is not involved here."[2] This is exceedingly puzzling, for it appears to be Taylor himself who is involved in the modal fallacy. The statement

he rejects does not mean one can render a proposition false after its being true, but expresses a counterfactual condition such that one can act so that the proposition would never have been true. In any case, Taylor concludes that God cannot foreknow what someone will do as a result of deliberation. For on the supposition that God believes that a man will perform some act, the man who deliberates about the act must believe it to be within his power to confute God's belief, which is absurd. By now, however, the fallacy of this reasoning is clear: since God's belief is counterfactually conditioned by the man's act, the man in deliberating does not assume the power to falsify or alter God's belief, but to act in such a way that however he should decide, God would have foreknown it.

### Foreknowledge and Divine Deliberation

Taylor's argument would be uninteresting, had it not served to spawn a more suggestive argument against foreknowledge based on deliberation, namely, that God's foreknowledge of His own future acts is incompatible with His deliberating about them. Thus, Richard Gale charges that a person with infallible precognition of the entire future would not have deliberation and intention.[3] He would not, in fact, be a person at all, but a robot mechanically playing out a script. Richard LaCroix attempts to give a little more substance to this allegation.[4] The traditional concept of God entails that

1. For any act that God performs, there is no time prior to that at which God does not know that He will perform that act.

2. If God knows at $t_1$ that He will do $a$ at $t_3$, then at $t_2$ it is not possible for God to refrain from doing $a$ at $t_3$.

An analysis of what it means to make a decision reveals that

3. Decisions are typically in time and occur at particular times.

4. Decisions typically involve our acts in the future about which we are uncertain.

5. Decisions typically involve either acts with respect to which there are genuine alternatives for acting or else acts with respect to which it is *believed* that there are genuine alternatives for action.

On the basis of these truths, LaCroix argues that ". . . God's acts cannot be the result of his choosing or deciding to perform those acts because it is not possible for God to decide or choose at all."[5]

The first argument in support of this conclusion runs: If it is possible for God to decide at $t_2$ to do $a$ at $t_3$, then at $t_1$ He has not yet

decided to do it. But then God does not know at $t_1$ whether or not He will do $a$ at $t_3$. But since this is incompatible with His omniscience, it follows that it is not possible for God to decide at $t_2$ to do $a$ at $t_3$.

The second argument runs: If it is possible for God to decide at $t_2$ to do $a$ at $t_3$, then either (i) it is possible at $t_2$ that God refrains from doing $a$ at $t_3$ and it is possible at $t_2$ that He does $a$ at $t_3$, or (ii) one of these possibilities fails to obtain, but God does not know that it fails to obtain. Obviously (ii) is false, since God is omniscient. As for (i), suppose that God does $a$ at $t_3$. He must then know at $t_1$ that He will do it. But in that case, it is not possible at $t_2$ that God refrain from $a$ at $t_3$. On the other hand, suppose that God does not do $a$ at $t_3$. Parity of reasoning then shows that it is not possible at $t_2$ for Him to do $a$ at $t_3$. Now since God either does or does not do $a$ at $t_3$, it follows that the opposite action respectively is not possible for Him at $t_2$. Hence, God cannot decide at $t_2$ to do $a$ at $t_3$.

This shows that it is impossible for God to make any decisions at all, concludes LaCroix. Therefore, divine foreknowledge is incompatible with divine freedom. He then spells out four consequences of this conclusion: (i) God is not omnipotent, (ii) God's intrinsic goodness cannot be explained in terms of the goodness of His acts, (iii) God cannot be a person, (iv) there is no problem of evil.

The similarity of LaCroix's second argument to that of Cahn and Taylor is, I think, evident, and he commits the same fallacies. His principle (2) is clearly false. LaCroix thinks that if it is denied, then one must say that it is possible both that God knows at $t_1$ that He will do $a$ at $t_3$ and that He refrains from $a$ at $t_3$. But as Wainwright and Quinn point out,[6] from the denial of (2) it only follows that if God knows at $t_1$ that He will do $a$ at $t_3$, then He will do $a$ at $t_3$, though it remains possible that He refrain. Hence, if God decides at $t_2$ to do $a$ at $t_3$, then He foreknows at $t_1$ what He shall decide. But His foreknowing His decision necessitates neither the decision nor the action.

LaCroix's first argument, however, questions the coherence of foreknowing one's own decision. His argument, as it stands, is not valid, however, since (3)-(5) are qualified by the word "typically." One might agree that these principles are generally true of decision-making without holding them to be universal. And it is far from clear that they are true if taken universally. As Quinn cautions, arguing from human decision-making can hardly be decisive when the issue concerns what an omniscient being could know. Take (3), for example: even if this characterizes hu.nan agents, why could there not be decisions of an eternal agent which are as eternal as the agent himself?[7]

Even if LaCroix's argument is sound, he has not shown that God's decisions must be drawn at any $t_n$. One might agree that it is not possible for God to decide at any point in time, but this does not preclude an eternal, free determination of the mind to pursue a course of action. Quinn also questions (4), noting that although the event which is God's decision has not occurred at $t_1$, still it is not obvious that at $t_1$ God could not foreknow what His decision would be at $t_2$. Even on the human level, Smith may know that if White asks him to a concert, he will decide to go. Suppose he learns that White will ask him. Then he knows that he will decide to go. Quinn's rejoinder implicitly makes a distinction between deliberation and decision. Smith has yet to decide to go, for White has not asked him, but his deliberation is over. Similarly, LaCroix's (4) really concerns deliberation, not decision, for one cannot deliberate about that about which one is certain. Quinn would say that while God does not deliberate, nevertheless He could make temporal decisions on the basis of what He knows from eternity. Even if we do not follow Quinn in ascribing temporal decisions to God, he is correct, I think, in distinguishing deliberation from decision. God, we may agree,[8] does not deliberate about His future actions, and we may consistently hold with this that God freely decides from eternity what He shall do.

Does this want of deliberation mean that God is not a person, but an automaton, as Gale claims? It would not seem so, for a person could have eternal intentions and perform intentional temporal actions without having at some time been in uncertainty about those actions.[9] To say that God never makes temporal decisions is simply to say that God has made up His mind from eternity and never changes His mind.

## Conclusion

So although we might agree that God never deliberates or makes temporal decisions, but foreknows from eternity what He will do, such a doctrine of divine foreknowledge seems not at all incompatible with divine freedom.

CHAPTER TWELVE

# THE BASIS OF DIVINE FOREKNOWLEDGE

The demise of theological fatalism allows another closely related issue, which is often conflated with fatalism, to surface, namely, *how*
God is able to know future contingents. That is to say, once we grant
that foreknowledge and future contingency are compatible, it might
still be asked how it is that an indeterminate event can be known
prior to its occurrence. Obviously it cannot be known by inference
from present states of affairs, since it is causally indeterminate with
regard to them. How then can it be known? In the end, it is on these
grounds that both Swinburne and Kenny deny divine foreknowledge
of the future, not because to affirm foreknowledge is fatalistic, but because, in Swinburne's words, there can be "no correlation" between
the acts of a future free agent and God's foreknowledge.[1] Similarly,
Anthony Kenny rejects Ockham's solution to the problem of divine
foreknowledge and human freedom—not because Ockham fails to provide a solution to theological fatalism, but because he could give no
"clear account" of how God could foreknow future contingents.[2] Some
die-hard fatalists have even tried to use such considerations to sneak
determinism in through the back door by arguing that the only way
God could know the future would be if everything were causally determined, thus precluding human liberty.[3] Hence, we are left with, if
not theological fatalism, at least theological determinism.

### God's Ability to Know Future Contingents

Now one way of answering the theological determinist would be to
adopt a B-theory of time. Since according to this theory the future is
as real as the present or past, God can know the future in the same
way He knows past and present. Moreover, a B-theory of time in
no way precludes the causal indeterminacy of events. Hence, God's
knowledge of past, present, and future, which are all on an ontological
par, is in no way obviated by the contingency of events in space-time.
Indeed, the most attractive feature of the B-theory, so far as I can see,
is that it explains so easily how God may know future contingents.

Unfortunately, it seems to me that the B-theory is wrong. The future does not merely not yet exist; it does not exist at all. Objective
becoming is essential to the nature of time. Therefore, the question

becomes whether on an A-theory of time God can know future contingents. This metaphysical prerequisite would appear to eliminate two further possible explanations of divine foreknowledge of future contingents, namely, backward causation and divine timelessness.[4] It cannot be maintained that future events retroactively cause God's precognitions of those events because this presupposes a B-theory of time, as we have seen. Similarly, a view of divine timelessness in which God is really related to the world seems to presuppose a B-theory in order that all events may be present to God in eternity.[5]

Since, according to the A-theory, future contingents do not exist and cannot be extrapolated from present causes, how can God know them? Now the assumption behind this question seems to be that all genuine knowledge is based upon immediate perception or causal inference. But how can we be certain of that? In fact, does not experience teach us that much of our knowledge, say, of ethical principles, for example, is acquired neither by sense perception nor causal inference? One might adjust the assumption such that all genuine, informative knowledge of the empirical world is based on immediate perception or causal inference. But what, then, of our knowledge that other minds or the external world itself exists? And how do we know that our heavy dependence upon perception and causal inferences is not a natural condition of embodied persons which is not applicable to a disembodied Mind? The objection seems to suffer from anthropocentrism. Obviously, God does not possess knowledge in virtue of sense perception. So why could God not possesses all knowledge wholly apart from causal inferences as well?

George Wall alleges that if we view the future as non-existent and God as temporal, then God cannot know an indeterminate future; otherwise He could infallibly predict the future, which by definition cannot be done.[6] But some differentiation seems in order here. The future is indeed undetermined at many junctures, since many events are not causally determined by antecedent events. But this must not be taken to mean that the future is therefore indeterminate in the sense that future-tense propositions are exempt from the Principle of Bivalence. We saw early on that future-tense propositions are in all likelihood as bivalent as past- and present-tense propositions. The future may therefore be regarded as determinate, though not determined. There is therefore no reason why infallible predictions cannot be given concerning a causally undetermined future, so long as the predictor knows the relevant true future-tense propositions. The question is, how does God know true future-tense propositions about causally undetermined events?

Khamara points out that this question is usually approached from either of two angles: the empiricist or the rationalist.[7] The empiricist approach tends to interpret God's foreknowledge along the lines of perception, whereas the rationalist approach tends to interpret it in purely conceptual terms. Khamara contends that assimilating foreknowledge to perception tends to equate God with an omniperceiver—perhaps the most startling example being Newton and Clarke's doctrine that just as the brain is our sensorium on which pictures are imprinted to be read by the mind, so space is, as it were, the sensorium of God.[8] Besides other difficulties, the perceptual model of God's knowledge runs into the problem that it seems incapable of providing knowledge of the past or future, according to Khamara, for the notion of literally perceiving the past or future does not make sense. We have seen in our previous discussion that such misgivings concerning the perceptual model of foreknowledge are entirely justified. Indeed, I should go so far as to say that the implicit assumption of this model underlies virtually all contemporary discussions which dispute the possibility of God's foreknowing future contingents.

But what about the rationalist approach to God's knowledge? Leibniz, for example, held that God knows the future because He knows everything conceptually. For Leibniz God's foreknowledge is based in the doctrine of predicate-in-subject, which enables God to have infallible, *a priori* knowledge of every truth. Now without wishing to adopt Leibniz's particular doctrine of foreknowledge, it seems to me that the rationalist approach to the subject of divine knowledge furnishes us with a viable alternative to the empiricist approach. A conceptualist model of divine knowledge could hold either that God's knowledge of future contingent propositions is logically posterior to His knowledge of some more primitive set of propositions or that His knowledge of future contingent propositions is simply innate and logically foundational. The first alternative represents an account of divine foreknowledge as based on His logically prior middle knowledge. Since this topic is so important and controversial, I prefer to leave it aside for the moment and ask rather whether an account of divine foreknowledge in terms of the second alternative could not be satisfactory. We have already seen that such a model has been suggested as an alternative to perceptual models of human precognition, and it seems quite appropriate for God's knowledge. God never learned or acquired His knowledge, but has eternally known an innate store of true propositions.[9] Since future-tense propositions are bivalent, God, in knowing innately all true propositions, knows the future.[10]

Of course, someone might persist in demanding, "*How* can God have innate knowledge of all future-tense propositions?" But the purport of this question is not altogether clear. It cannot mean, "How did God come by such knowledge?", for His knowledge is said to be innate. Nor do I think the question means, "How is the concept of innate knowledge possible?", for the concept does not appear to be incoherent. Perhaps the question really means, "How is it the case that God has innate knowledge?" But then it appears to be just an expression of incredulity which could be posed of any of the divine attributes: how is it that God exists necessarily? How is it that God is omnipotent? How is it that God is morally perfect? This sort of "how" question does not seem to have any answer—He just is that way.[11] About the only answer that could be given to this question is, I think, Ockham's: God has the essential property of, say, knowing only and all true propositions. Being maximally excellent, He has that property in all worlds in which He exists and since He exists in the actual world, it is the case that God knows all true propositions. To ask how it is that God is omniscient is therefore like asking how it is that vacuums are empty.

### *Knowledge vs. True Belief*

The detractor of divine foreknowledge might, however, lodge one last objection: granted that God may be so constituted that He by nature possesses from eternity only and all true beliefs, still this does not deserve to be called knowledge. For knowledge is not simply true belief—there must be some justification for that belief, and in God's case such justification is lacking. God may entertain only and all true beliefs, all right, but He has no epistemic grounds for His beliefs about future contingencies. Such beliefs are in a sense just correct guesses, not knowledge.

This seems to have been, one will recall, Prior's final complaint about divine foreknowledge:

> I think I can attach intelligible sense to the phrases "was *true* yesterday' and 'was *the case* yesterday' which give the Occamist results; but I cannot find any such sense for 'was *known* yesterday.' I can cause a person's guess made yesterday to have been correct by my free choice tomorrow. I can also tomorrow verify a person's guess right now that the person's guess yesterday was indeed correct. But I don't see how these contingent futures or future-infected pasts can be known. The alleged knowledge would be no more than correct guessing. For there could be *ex hypothesi* nothing that could *make* it knowledge, no present *ground* for the guess's correctness which a specially penetrating person might perceive.[12]

Streveler in his response to Prior seems to miss the point of this argument. Prior, he claims, begs the question by assuming a present ground is required in order to make an alleged piece of knowledge genuine knowledge. But why, he asks, "cannot some future ground, which will eventually be actualized, be the justification for calling the alleged piece of knowledge genuine knowledge?"[13] Streveler's suggestion is relevant to the truth value of future-tense propositions, for in their case it is indeed the future events themselves that furnish the truth conditions for such propositions. But such future events cannot furnish the epistemic warrant for calling true belief about the future genuine knowledge, for one would have to have foreknowledge of them before they could ground one's beliefs, which is circular. If one's true beliefs are to be justified so as to constitute genuine knowledge, the justification must be present with the beliefs; otherwise, it comes merely as confirmation of an earlier correct guess.

But does God not have adequate justification for regarding His beliefs as true? Among God's beliefs at the moment of creation was, for example, the belief

> 1. In the year A.D. 1974 Plantinga will defend the ontological argument for God's existence.

Did God have adequate justification for this true belief? Surely He did. For also among His store of beliefs was

> 2. God holds only and all true beliefs.

Since (1) is among the beliefs God holds, (1) must be true, if (2) is true. In knowing himself to be God, God is justified on the basis of (2), which is a necessary truth, in believing the beliefs that He does. Now the determined sceptic might demand whether God is justified in believing

> 3. I am God.

But surely there seems to be something perverse in such a demand: for a being who really is God, (3) would seem to be a truth which He would know simply by acquaintance. Indeed, one could say that all God's beliefs, including this one, are just properly basic beliefs which are justified (in the strong sense) in virtue of His being in the circumstances of being God.

Another way of approaching the question of God's knowledge of (3) is by distinguishing with David Lewis between attitudes *de dicto* and *de se*.[14] Lewis argues that properties, not propositions in the sense of a set of possible worlds, are the objects of our attitudes because if a property belongs to some but not to all inhabitants of some world, it

does not correspond to any proposition and cannot replace a propositional object. What Lewis has in mind are beliefs whereby we ascribe to ourselves properties that do not correspond to propositions. Take, for example, Rudolf Lingens, who is lost somewhere in the stacks of the Stanford Library. He will not be helped in locating himself simply by "book learning"—he needs to self-ascribe a property of being in a certain perceptual situation. Book-learning can help him to learn that he inhabits a world where exactly one person is in that perceptual situation and that one is Rudolf Lingens. His problem is resolved by the marriage of propositional belief (belief *de dicto*) and his perceptual belief (belief *de se*), which is non-propositional. Self-ascription of properties is thus belief or knowledge *de se* and is broader than knowledge *de dicto*.

Knowledge *de se* is critical in knowledge of one's personal identity. Lewis invites us to envisage a world in which two omniscient deities exist. How can each know which one he is? "They inhabit a certain possible world, and they know exactly which world it is. Therefore they know every proposition that is true at their world. Insofar as knowledge is a propositional attitude, they are omniscient. Still I can imagine them to suffer ignorance: neither one knows which of the two he is."[15] The problem is not that they are exactly alike; they could be very different. Rather the difficulty is that in knowing propositional truth, each cannot know that "*I* am the god who has property *x*." They can and do know that in their world one of the gods has property *x*, but neither can know "I am that god." Since the personal indexical "I" does not characterize the propositional content of such a sentence, propositional knowledge alone is insufficient for a knowledge of personal identity. "But if it is possible to lack knowledge and not to lack propositional knowledge, then the lacked knowledge must not be propositional. If the gods came to know which was which, they would know more than they do. But they wouldn't know more propositions. There are no more to know. Rather they would self-ascribe more of the properties they possess."[16]

Without self-ascription of properties one would at best possess *de re* knowledge of oneself. But such knowledge may not be *de se* knowledge. For example, says Lewis, I could see myself reflected in a mirror without realizing that it is me I see whose pants are on fire. In such a case, I have *de re* knowledge of my condition without possessing knowledge *de se*. But if I wait a second, I shall soon be in possession of *de se* knowledge as well!

The application to the problem at hand is obvious. In knowing
(3), God possesses knowledge which is *de se*, not merely *de dicto*.
Knowledge *de dicto* would yield God only a *de re* knowledge of himself,
but the self-ascription of properties would enable him to know (3) *de
se*. His *de se* knowledge of (3) comes simply by acquaintance. Such
an understanding of God's knowledge has, as Grim points out, some
interesting implications for our concept of omniscience.[17] If we accept
Lewis's analysis, God has knowledge of all true propositions, and
then some, namely non-propositional knowledge about Himself. But
He does not possess all non-propositional knowledge, for He cannot
know *de se* what creatures know *de se*. Given Lewis's analysis, it
seems clear then that God is justified in His propositional beliefs,
since the truth of His beliefs is entailed by the *de se* knowledge that
He is God and the *de dicto* knowledge that God holds only and all
true beliefs.

But in any case, if our definition of knowledge implies that a being
who holds only and all true beliefs and does so essentially nonetheless
cannot be said to have "knowledge", then something must be wrong
with our theory of knowledge.[18] And in fact many recent philoso-
phers working in epistemology have contended that this is the case.[19]
According to the standard view, for an agent $S$ and proposition $p$,

  4. $S$ knows that $p$ iff

   a. $p$ is true;
   b. $S$ believes that $p$;
   c. $S$ is justified in believing that $p$.

It has usually been assumed that implicit in (4c) is

  5. "$S$ knows that $p$" entails that "$S$ knows that he knows that
  $p$."

According to (5) one cannot know that $p$ unless one knows that he
is justified in truly believing that $p$. Scepticism draws its life from
(5), for (5) generates in effect an infinite regress, such that one cannot
know that he knows that $p$. One might try to cut short this regress via
a foundationalist theory according to which one begins with a set of
basic self-evident and incorrigible beliefs; but so meager a foundation
cannot support the inductive inferences necessary to furnish us with
informative knowledge of the world. Thus (4c) appears to force one
into scepticism. It has been suggested that (4c) be construed such
that the evidence need not guarantee the truth of $p$ but in some sense
renders $p$ most likely true, while being compatible with the falsity of
$p$. But all such attempts at relaxation of (4c) succumb to the Gettier

paradoxes.[20] Gettier argues that any version of (4) which also maintains

> 6. It is possible for $S$ to have adequate evidence for believing that $p$ when $p$ is false

and

> 7. If $S$ has adequate evidence for believing that $p$, and if $p$ entails $q$, and if $S$ accepts $q$ as a result of this deduction, then $S$ has adequate evidence for believing that $q$

is subject to counterexamples of cases which (4) would sanction as knowledge, but which quite plainly ought not to be so regarded. Noting that attempts to block the counter-examples by modifying (7) have only led to more counter-examples, Suppe and others have suggested instead that (6) be denied. While at first blush this would seem to plunge one back into scepticism, since one can never have enough evidence to guarantee that $p$, this result only follows if one also maintains (5). But if one denies both (5) and (6), one can escape the Gettier paradoxes without lapsing into scepticism. This approach thus makes a clear distinction between one's being justified in believing that $p$ and one's being justified in his defense of claims to know that $p$. It allows one to know that $p$ under circumstances in which one is ill-equipped to defend his claim to know that $p$.

When then is condition (4c) met, such that one's true beliefs qualify as knowledge? Usually the answer is given in terms of counterfactuals involving a causal relationship between the circumstances described by $p$ and one's belief that $p$, such that one would not believe $p$ unless $p$ were true. If, whenever the circumstances described by $p$ obtained, one were caused in part by those circumstances to believe that $p$, one could be said to know that $p$. This causal account of knowledge encounters various difficulties, however, especially with regard to mathematical and ethical knowledge, where no causal connection holds. But the central insight of this approach seems promising, and Nozick has formulated a definition of knowledge which avoids any appeal to causal relations.[21] According to Nozick, the key in turning true belief into knowledge is some sort of linkage between (4a) and (4b). To provide such, he substitutes two subjunctive conditionals for (4c) so that (4) now becomes

> 4′. $S$ knows that $p$ iff
>
> a. $p$ is true;
> b. $S$ believes that $p$;
> c. if $p$ were false, $S$ would not believe that $p$;
> d. if $p$ were true, $S$ would believe that $p$.

Nozick's is thus a "tracking" theory of knowledge: $S$ may be said to know that $p$ because $S$'s beliefs "track" the truth.

Nozick goes on to qualify (4'd) because it would exclude some cases which should be regarded as genuine cases of knowledge. To take care of these cases (4') must be relativized to the ways or methods of believing. Even when these are taken into account, however, Nozick's theory does not seem to be able to handle all cases of genuine knowledge.[22] But if Nozick's theory does not appear capable of rendering an adequate account of human knowledge, it must be said that it provides a striking account of God's knowledge. If, as I have argued, God does not acquire His beliefs, there is no necessity of relativizing (4') in His case, for God has no methods or ways of coming by His beliefs. Therefore, (4'), while too stringent an account of knowledge for human persons, might be able to serve as a characterization of divine knowledge. Not only does God possess only true beliefs, but His beliefs infallibly track the truth, so that were any proposition true, He would believe it and were any proposition false He would not. According to Nozick,

> A person knows that $p$ when he not only does truly believe it, but also would truly believe it and wouldn't falsely believe it. He not only actually has a true belief, he subjunctively has one. It is true that $p$ and he believes it; if it weren't true he wouldn't believe it, and if it were true he would believe it. To know that $p$ is to be someone who would believe it if it were true, and who wouldn't believe it if it were false.[23]

Clearly, God is such a someone. In a sense, then, the detractor of divine foreknowledge faces a hard dilemma: either admit that God's true beliefs constitute knowledge or lapse into a scepticism which denies virtually all knowledge of the world whatever.

In any case, if God is essentially omniscient, then one could reject (5) and hold that (4c) is met because it is logically impossible for God to be mistaken in His beliefs. Therefore, all His beliefs are justified, including His beliefs about future contingents.

In light of our discussion, then, in this section and throughout this work, how superficial and disappointing must the account of divine foreknowledge given by Swinburne appear, whose *Coherence of Theism* is taken to be the paradigmatic defense of classical theism![24] Swinburne concludes that God knows only those future-tense propositions which report events physically determined by past or present causes. He is led to this conclusion chiefly because he believes foreknowledge to entail backward causation and backward causation to be logically impossible. We have seen that Swinburne's arguments for the logical impossibility of backward causation fail; but what reason does he provide to think that foreknowledge entails backward cau-

sation in the first place? Following Nelson Pike, he contends that while one can act so as to render a future-referring proposition true at an earlier time, one cannot act so as to render a proposition totally about the past true at an earlier time. To do the latter would require backward causation of the state of affairs described by the proposition. Since propositions about what beliefs a person held are totally about the past, one cannot bring it about that such propositions had the truth value which they did. Hence, God's beliefs, reasons Swinburne, cannot be brought about by future events. Now it could be the case, he concedes, that all God's beliefs just happen coincidentally to be true. But in such a case, His beliefs would not be justified. If all future events were determined, He would be justified in inferring them from present causes. But since at least His own future free acts are causally undetermined, He cannot foreknow them, since such knowledge would require backward causation, which is logically impossible. Unfortunately, these assertions are bereft of substantiation and careful analysis. We have seen repeatedly that the counterfactual dependence of God's knowledge upon future states (a relation of which Swinburne says nothing) is not backward causation, that a rationalist (as opposed to perceptual) model of divine knowledge provides a satisfactory account of God's knowledge of future contingent propositions, and that God's true beliefs deserve the name of knowledge. Swinburne concludes that God's omniscience is attenuated; He is omniscient only in the sense that He knows every true proposition which it is logically possible to know. It is logically impossible that there be an omniscient person who is perfectly free, perfect freedom meaning that no causal factors affect one over which one lacks control. But having said that, in the next breath Swinburne asserts that God's knowledge of the future is limited because of His own choice! God, says Swinburne, voluntarily limits His knowledge to preserve His own freedom. But this can only mean that God allows Himself not to be limited by causal factors outside His control, which is patently incoherent.[25] I can only conclude that Swinburne has failed to offer any cogent reason for thinking that backward causation is a necessary condition of divine foreknowledge or to even consider, much less offer any objection to, a rationalist approach to the issue of how God possesses knowledge of future contingents.

## Conclusion

In conclusion, therefore, it seems that the orthodox theist need have no more fear of theological determinism than of theological fatalism.

No argument has been given to show that all knowledge of the world must be acquired by immediate perception or causal inference. Even on the preferable A-theory of time, a rationalist model of divine fore-knowledge, according to which God possesses innate knowledge of all true propositions, provides a coherent account of God's knowing future contingencies. Nor can His foreknowledge be denigrated as mere true belief. For not only would God appear to be justified in holding His true beliefs, but the very account of knowledge which would deny Him genuine knowledge fails as an adequate analysis of knowledge and threatens to reduce us all to scepticism. Alternative approaches, such as a tracking theory, have yet to be fully worked out, but may yield more satisfactory accounts of human knowledge and in any case seem to be particularly suggestive for explaining divine knowledge. And if God is essentially omniscient, then His beliefs are justified simply because it is logically impossible for Him to be mistaken. What God therefore believes He also knows.

# MIDDLE KNOWLEDGE

In the last two chapters, I begged off discussing a particular solution to the problems there discussed that, if successful, would both allow deliberation to God and furnish a basis for divine foreknowledge of future contingents: *scientia media,* or middle knowledge. Due to the controversial character of this solution, I preferred to resolve those problems without making appeal to middle knowledge, but no discussion of divine omniscience would be complete without treating this intriguing solution.

## *The Doctrine of Middle Knowledge*

### Natural, Middle, and Free Knowledge

Largely the product of the creative genius of the Spanish Jesuit of the Counter-Reformation Luis Molina (1535-1600), the doctrine of middle knowledge proposes to furnish an analysis of divine knowledge in terms of three logical moments.[1] Although whatever God knows, He has known from eternity, so that there is no temporal succession in God's knowledge, nonetheless there does exist a sort of logical succession in God's knowledge in that His knowledge of certain propositions is conditionally or explanatorily prior to His knowledge of certain other propositions. That is to say, God's knowledge of a particular set of propositions depends asymmetrically on His knowledge of a certain other set of propositions and is in this sense posterior to it. In the first, unconditioned moment God knows all *possibilia,* not only all individual essences, but also all possible worlds. Molina calls such knowledge "natural knowledge" because the content of such knowledge is essential to God and in no way depends on the free decisions of His will. By means of His natural knowledge, then, God has knowledge of every contingent state of affairs which could possibly obtain and of what the exemplification of the individual essence of any free creature could freely choose to do in any such state of affairs that should be actual.

   In the second moment, God possesses knowledge of all true counterfactual propositions, including counterfactuals of creaturely freedom. That is to say, He knows what contingent states of affairs would ob-

tain if certain antecedent states of affairs were to obtain; whereas by
His natural knowledge God knew what any free creature *could* do in
any set of circumstances, now in this second moment God knows what
any free creature *would* do in any set of circumstances. This is not
because the circumstances causally determine the creature's choice,
but simply because this is how the creature would freely choose. God
thus knows that were He to actualize certain states of affairs, then
certain other contingent states of affairs would obtain. Molina calls
this counterfactual knowledge "middle knowledge" because it stands
in between the first and third moment in divine knowledge. Middle
knowledge is like natural knowledge in that such knowledge does not
depend on any decision of the divine will; God does not determine
which counterfactuals of creaturely freedom are true or false. Thus,
if it is true that

> If some agent $S$ were placed in circumstances $C$, then he would
> freely perform action $a$,

then even God in His omnipotence cannot bring it about that S would
refrain from $a$ if he were placed in $C$. On the other hand, middle
knowledge is unlike natural knowledge in that the content of His
middle knowledge is not essential to God. True counterfactuals are
contingently true; $S$ could freely decide to refrain from $a$ in $C$, so that
different counterfactuals could be true and be known by God than
those that are. Hence, although it is essential to God that He have
middle knowledge, it is not essential to Him to have middle knowledge
of those particular propositions which He does in fact know.

Molina maintained that God has middle knowledge of all true coun-
terfactuals of freedom concerning finite free creatures, but that He
does not possess knowledge at this second moment of such counter-
factuals concerning decisions of His own will. Molina believed that
such knowledge would rob God of His freedom, presumably because
which counterfactuals are true or false does not depend on God's
will. Molina supported exempting decisions of God's own will from
divine middle knowledge on the basis of his doctrine of supercompre-
hension. According to that doctrine, God has middle knowledge of
free creaturely decisions because the infinite divine intellect infinitely
surpasses the finite will, so that God's intellect discerns even the free
decisions of such a will in any set of circumstances; but since the
divine will is as infinite as the divine intellect, the latter does not
surpass the former and merely comprehends it completely, not super-
comprehends it, so that God knows only what He *could* will in any set
of circumstances. Molina's fellow Jesuit and contemporary Francisco
Suarez, however, took issue with Molina on this point, arguing that

God does possess middle knowledge of even His own acts of will.[2] Suarez argues that since the truth of counterfactuals concerning the divine will are true precisely on the basis of what God would freely decide to do, the truth of such counterfactuals does not remove divine liberty. He also rejects Molina's account of supercomprehension, arguing that even an infinite intellect cannot know more than the knowable, so that if a comprehensive knowledge of a creature's will does not disclose its free decisions, then an appeal to supercomprehension is fanciful. Rather Suarez champions the validity of the Law of Conditional Excluded Middle, contending that in a contradictory pair of counterfactuals, it must be the case that one is true and the other false, and this holds for propositions about the uncreated as well as the created will. Since God essentially knows all truth, He simply knows by an immediate intuition all true counterfactuals.

Intervening between the second and third moments of divine knowledge stands God's free decree to actualize a world known by Him to be realizable on the basis of His middle knowledge. By His natural knowledge, God knows what is the entire range of logically possible worlds; by His middle knowledge He knows, in effect, what is the proper subset of those worlds which it is feasible for Him to actualize. By a free decision, God decrees to actualize one of those worlds known to Him through His middle knowledge. According to Molina, this decision is the result of a complete and unlimited deliberation by means of which God considers and weighs every possible circumstance and its ramifications and decides to settle on the particular world He desires. Hence, logically prior, if not chronologically prior, to God's creation of the world is the divine deliberation concerning which world to actualize.

Given God's free decision to actualize a world, in the third and final moment God possesses knowledge of all remaining propositions that are in fact true in the actual world, including future contingent propositions. Such knowledge is denominated "free knowledge" by Molina because it is logically posterior to the decision of the divine will to actualize a world. The content of such knowledge is clearly not essential to God, since He could have decreed to actualize a different world. Had He done so, the content of His free knowledge would be different.

Middle knowledge, therefore, cannot be reduced to natural knowledge because: (1) the content of such knowledge is not essential to God, and (2) the truth of propositions known through such knowledge depends on free will, whether that of creatures or God. But neither can middle knowledge be regarded as a species of free knowledge be-

cause: (1) such knowledge is prior to the decree of God's will, and (2) the content of such knowledge does not lie within the scope of His power.

### Theological Ramifications

Apart from the Scriptural proof-texts, undoubtedly the major motivation for Molina in positing middle knowledge in God is the tremendous theological capital to be gained by such a supposition. Molina's scheme would resolve in a single stroke most of the traditional difficulties concerning divine prescience, providence, and predestination.

First, middle knowledge provides the basis for God's prescience, or foreknowledge, of future contingents. For since He knows what contingent states of affairs would obtain, were certain other states of affairs to be actualized, as well as the decision of His will to actualize the relevant states of affairs, He consequently knows what contingent states of affairs will obtain. Of course, the antecedent states of affairs may themselves be contingent upon finite free decisions, so that God could actualize those states of affairs only by means of His middle knowledge of what still prior states of affairs He would need to actualize in order to achieve them. But by means of His knowledge of counterfactuals of freedom and His free decree to actualize, strongly or weakly (that is, directly or indirectly), certain antecedent states of affairs, God possesses knowledge of the consequents of such conditionals, and, hence, foreknowledge of contingent events in the actual world that are yet to happen. This understanding of the basis of divine foreknowledge is a conceptualist model, for God's foreknowledge is not based on His perception of future events or, indeed, anything *extra se*, but, as Molina emphasizes, is derived wholly from within God's intellect. On the basis of His supercomprehension of every individual essence, which exists not as an independent abstract object but conceptually in the divine mind, or on the basis of His simple intuition of all and exclusively true propositions, which again have no ontological status outside their existence in the divine intellect, God knows only and all true counterfactuals of creaturely freedom; and knowing the decision of His own will to actualize the antecedent states of affairs of certain of these conditionals, God thus foreknows, wholly without reference to any external thing, what the actual future shall be. Middle knowledge thus supplies the key to divine foreknowledge.

Middle knowledge is also instrumental in God's providence, which is His ordering of things to their ends, either directly or mediately

through secondary agents. Molina distinguishes between God's absolute and conditional intentions for creatures. It is, for example, God's absolute intention that no creature should sin and that all should reach beatitude. But it is not within the scope of God's power to control what free creatures would do if placed in any set of circumstances. In certain circumstances, then, creatures would freely sin, despite the fact that God does not will this. Should God then choose to actualize precisely those circumstances, He has no choice but to allow the creature to sin. God's absolute intentions can thus be frustrated by free creatures. But God's conditional intentions, which are based on His middle knowledge and thus take account of what free creatures would do, cannot be so frustrated. It is God's conditional intention to permit many actions on the part of free creatures which He does not absolutely will; but in His infinite wisdom God so orders which states of affairs obtain that His purposes are achieved despite and even through the sinful, free choices of creatures. God thus providentially arranges for everything that does happen by either willing or permitting it, and He causes everything to happen insofar as He concurs with the decisions of free creatures in producing their effects, yet He does so in such a way as to preserve freedom and contingency. Via the doctrine of middle knowledge, therefore, the old tension between divine sovereignty and human freedom is resolved.

Middle knowledge also serves to reconcile predestination and human freedom. On Molina's view predestination is merely that aspect of providence pertaining to eternal salvation; it is the order and means by which God ensures that some free creature attains eternal life. Prior to the divine decree, God knows via His middle knowledge how any possible free creature would respond in any possible circumstances, which include the offer of certain gifts of prevenient grace which God might provide. In choosing a certain possible world, God commits Himself, out of His goodness, to offering various gifts of grace to every person which are sufficient for his salvation. Such grace is not intrinsically efficacious in that it of itself produces its effect; rather it is extrinsically efficacious in accomplishing its end in those who freely cooperate with it. God knows that many will freely reject His sufficient grace and be lost; but He knows that many others will assent to it, thereby rendering it efficacious in effecting their salvation. Given God's immutable decree to actualize a certain world, those who God knew would respond to His grace are predestined to do so in the sense that it is absolutely certain that they will respond to and persevere in God's grace. There is no risk of their being lost; indeed, *in sensu composito* it is impossible for them to fall away. But

*in sensu diviso* they are entirely free to reject God's grace; but were they to do so, God would have had different middle knowledge and they would not have been predestined. Similarly those who are not predestined have no one to blame but themselves. It is up to God whether we find ourselves in a world in which we are predestined, but it is up to us whether we are predestined in the world in which we find ourselves. God's selection of a possible world is entirely without regard to how any given person in that world would respond to His grace, so that predestination is unmerited and gratuitous. But no matter what world a person may be in, in that world God accords him sufficient grace for salvation; it is therefore up to each person whether in that world he is predestined or not. Thus, predestination and human freedom are entirely compatible.

### Grounds for Affirming Middle Knowledge

Should theists follow Molina and Suarez in positing middle knowledge in God and, if so, on what grounds? It would be very difficult to demonstrate this directly either biblically or philosophically. For here a distinction sometimes obscured in recent discussion needs to be kept clear: the difference between middle knowledge and simple counterfactual knowledge. One might be able to prove biblically or philosophically that God possesses knowledge of true counterfactual conditionals. Biblically, there are passages that do seem to imply that God knows what would be the case if certain events which will happen were not to happen, and this even when the actions of free agents are involved.[3] Philosophically, one might succeed in arguing that counterfactual conditionals are subject to the Law of Conditional Excluded Middle and are therefore true or false; since God, being omniscient, knows only and all true propositions, He must know true counterfactual conditionals. But these arguments, even if successful, would only suffice to prove that God possesses counterfactual knowledge, not middle knowledge. These are not the same, as the Dominican opponents of *scientia media* such as Alvarez realized.[4] They held that God does possess knowledge of all true counterfactual conditionals, but what they denied was that He does so prior to the decree of the divine will. In their view God, in decreeing to actualize this world, simultaneously decrees what would be the case were different states of affairs to obtain, so that counterfactual knowledge belongs to God's free knowledge. Prior to God's decree there exists only His *scientia simplicis intelligentiae*, or natural knowledge. God's fore-

knowledge cannot therefore be based on His counterfactual knowledge, since both belong to the same logical moment posterior to the divine decree. Thus, an opponent of middle knowledge need not deny that God has knowledge of counterfactuals of freedom or of any other sort of counterfactual conditional. He could freely accept contemporary analyses of the truth conditions of such conditionals in terms of possible worlds semantics and yet deny that such conditionals are true and, hence, known by God, in that conditionally prior moment to the divine decree, or deny that such a moment even exists. At best, then, the biblical and philosophical arguments would succeed in showing that God possesses simple counterfactual knowledge, not middle knowledge. It is very difficult to see how one could prove biblically or philosophically that God has His knowledge of counterfactual conditionals prior to the divine decree.

At the same time, however, it needs to be kept in mind that the defender of middle knowledge is under no obligation to shoulder the burden of proof in this dispute. His is a position of *defense*: against the allegation that it is impossible for God to know future contingents, he responds that he can produce a model of divine knowledge that supplies a basis for foreknowledge. All he must do is show that such a model is not impossible in order to defeat his opponent's objection; he could even agree that his model is false, that God in fact does not possess middle knowledge. The the point remains that if such a model is *possible*, then the objection that divine foreknowledge of future contingents is impossible fails—it would only follow that, if no other explanation is forthcoming, we do not know how God foreknows future contingents. But it would be an exercise of *hubris* to suppose that we *should* know how it is that God actually knows future contingents; the theist may content himself with the demonstration that such a doctrine is not incoherent.

Attempts to show that the doctrine of middle knowledge is not even possibly true shall be taken up below; but for now, it may be profitable to continue our inquiry into whether and on what grounds the theist should posit middle knowledge in God. If biblical and philosophical arguments are insufficient to warrant such a conclusion, it nevertheless seems to me that, as Molina pointed out, there are powerful theological reasons for adhering to a doctrine of middle knowledge. In the first place, a doctrine of divine prescience without a conditionally prior middle knowledge is exceedingly bizarre.[5] If God has only simple foreknowledge, then He just, so to speak, *finds* Himself with the actual world on His hands rather than some other world. If prior to the creative decree of the divine will God possesses only natural

knowledge, then in selecting a possible world containing contingent events, He has scarcely any idea whatsoever what will in fact be the case. Creation becomes a blind act of will, the result bearing almost no relation to the intention. God must, at least, be interested to discover, in the moment logically posterior to the divine decree, that the second person of the Trinity will become incarnate and expire on a Roman cross in first century Palestine to save mankind from its sin. In the moment prior to the decree, He knew that the actual world was one of an infinite number of possibilities, but He had no idea that it would in fact obtain. God, as I say, just finds Himself in the exemplification of the actual world with His foreknowledge of the future events in it. One could seek to elude this consequence by denying that there is any conditionally or logically prior moment in God's knowledge or decree, but such a denial seems untenable. For clearly God's decree to actualize a world is conditionally prior to the actual world's obtaining and, hence, to His knowledge of which world does obtain, even if He has such knowledge from eternity past (or even timelessly). For the actual world obtains because God decreed it.[6] Furthermore, His knowledge of all possible worlds must logically precede His decree of a world, otherwise His decree is not an act of intelligence. But then we are confronted with our original problem: if God's foreknowledge is preceded merely by natural knowledge and the decree, then God is merely confronted with the exemplification of the actual world and His foreknowledge of it as a surd fact.

Secondly, divine providence becomes exceedingly peculiar without middle knowledge. If He has middle knowledge, then God can so plan the world that His ends will be achieved through the free decisions of creatures. But simple foreknowledge provides no basis for such planning: if God foreknows that man will sin, for example, there is no way that He can act on the basis of such knowledge to prevent man's fall, for that would be tantamount to changing the future, which is logically impossible. His designs have to be made logically prior to His foreknowledge of the future. But if He has no middle knowledge, then in that prior moment we must say either with the Thomists that God decrees which world to actualize and then strongly actualizes it by causing the wills of secondary agents to choose this way or that—which makes God the author of sin, as Molina charged— or else that God's actualizing a world is a blind act without planning or direction or knowledge of the result—which is certainly not the biblical concept of creation (Prov. 8.22-31).[7] At best God could know that however the actual world will turn out to be He can and will interact with it so as to bring about His ends; He then decrees to

create, and consequently finds Himself in the actual world interacting
with creatures to achieve His ends. He may even find that He will
cause some earlier events in history because of later events which
will happen (e.g., retrospective prayer). But none of this will be the
result of God's planning; He just finds the world that way. Moreover,
it is far from obvious that God could in fact bring about His ends
without infringing the freedom of creatures at key points in history.
For He has no control over the free decisions that they will make. In
any case, such a concept of providence is biblically inadequate, since
the Judaeo-Christian concept of divine sovereignty was so strong that
everything which happens is in a sense ordained by God.[8] Molina's
doctrine of providence based on (i) middle knowledge, (ii) the absolute
and conditional will of God, and (iii) simultaneous divine concurrence
provides the most promising account of divine providence and its
compatibility with freedom and contingency.

Finally, with regard to predestination, without middle knowledge
God could not be sure that anyone at all would respond to His gra-
cious initiatives. For all He knew in that prior moment, it might be
the case that every finite person would be eternally damned, which
would make the decree to create a disastrous tragedy. Of course, it
might be said that predestination is God's very means of assuring
that the elect will be saved: in that prior moment He decrees their
destiny and then consequently causes them to respond to His grace.
One problem with such a view of predestination, however, is the clear
biblical teaching that the elect can fall away and be lost.[9] Predestina-
tion, then, is not something that necessitates perseverance and glori-
fication. Whether Molina's own account of predestination is faithful
to the New Testament concept may be left to the biblical scholars;[10]
my only point is that, however predestination be construed, it does
not render impossible the apostasy of the elect, so that apart from
middle knowledge God had no way of knowing whether heaven might
not in the end be empty.

It seems to me, therefore, that there are, indeed, weighty theolog-
ical reasons for positing middle knowledge in God. Without middle
knowledge prescience, providence, and predestination become enig-
matic; but given middle knowledge, their basis and compatibility with
human freedom become perspicuous. Unless and until the concept of
middle knowledge can be shown to be incoherent or inimical to bib-
lical theism, therefore, I believe on theological grounds that middle
knowledge ought to be regarded as an actual facet of divine omni-
science.

### Objections to Middle Knowledge

What objections then might be urged against a doctrine of middle knowledge? Although I cannot pronounce on the worth of the seventeenth century literature that surrounded the "*de auxiliis*" controversy, it seems to me that much of the more recent Catholic polemical literature concerning middle knowledge has generated more heat than light, particularly since a great deal of this acrimonious debate centers merely on which school represents faithfully the teaching of St. Thomas.[11] Fortunately, through the work of men like Alvin Plantinga and Robert Adams, the controversy has very recently penetrated the realm of analytic philosophy, where it has stimulated an exceedingly interesting and profitable debate.

Traditionally Thomists have offered chiefly three critiques of the doctrine of middle knowledge:[12] (1) middle knowledge is impossible because it lacks any object, (2) middle knowledge posits passivity in God, and (3) middle knowledge destroys divine freedom. Let us examine each of these in turn.

### The Object of Middle Knowledge

Traditionally, the first objection to middle knowledge has been expressed by its Thomistic opponents in their demand for an account of through what *medium* God knows the free decisions of finite wills apart from the divine decree. So-called conditional future contingents, which never will in fact be, but *would* be, *were* some antecedent condition different, are twice removed from reality, so to speak, since they not only do not yet exist, but never will exist. How then can propositions about such events be determinately true? For apart from God's decree, nothing is determinate in their regard. Future conditional propositions cannot derive truth from themselves, for then such propositions would be necessarily true; but neither can they be true in virtue of the contingent circumstances or free causes therein described, for these do not exist. Thus, there is no means by which God could possess knowledge of conditional future contingents, unless He knows them in His own divine decree.

Hippolyte Gayraud, a modern critic of Molinism, has unfolded the traditional Thomistic critique of middle knowledge in two ways:[13] (1) Nothing is knowable except according to what exists. But prior to the divine decree, "futuribles" do not at all exist. Therefore, prior to the divine decree, "futuribles" are not knowable. Independent of God's decree, conditional futures have no ground in the divine essence

nor truth in themselves; so *in quo medio* are they known? (2) If propositions concerning such events have truth in the divine essence prior to God's decree, then they are necessarily true and freedom is destroyed. A free cause is in its nature indeterminate or in potentiality to act or not to act. Therefore, if God sees in a thing's nature that it would act one way or the other, it is not free. Free will is in its nature indifferent to one or the other alternative and therefore its operations cannot be known by God even through supercomprehension.

As for Suarez's argument based on the Law of Excluded Middle, Gayraud responds:[14] (i) Prior to the divine decree "This will be" or "This will not be" is not true or false. Therefore, Suarez's principle is not universally valid. (ii) The truth of a proposition presupposes the objective reality of the thing signified. If the objective reality of a thing depends on the free determination of an agent, the truth of the proposition expressing this reality depends on this agent's determination. Thus, concerning things which depend on God's decree for their objective reality, it also depends on God's decree that the relevant propositions are true and false. Hence, prior to His decree they are neither true nor false. (iii) Given two contradictory propositions of which one is true and the other false, it remains to be determined which is which. This determination requires the objective reality of one rather than the other to be determined. Therefore, *in quo medio* does God know determinately the truth of one and the falsity of the other?

Now it seems to me that this objection raises three distinct issues, which are very often blurred in discussions of this subject: (1) are some counterfactuals of freedom true, (2) if so, are they true prior to the divine decree, and (3) if so, can they be known by God? Let us examine each in turn.

*Are Counterfactuals*
*of Freedom True?*

Although he fails to differentiate clearly the above three questions, Robert Adams has answered the first unequivocally in the negative: ". . . conditional propositions of the sort that are supposed to be known by middle knowledge cannot be true."[15] Taking as a springboard for his discussion the story of David at Keilah in I Sam. 23.1-14, Adams invites us to consider the following two propositions:

1. If David stayed in Keilah, Saul would besiege the city.

2. If David stayed in Keilah and Saul besieged the city, the men of Keilah would surrender David to Saul.

"If we suppose that God is omniscient," writes Adams, "we cannot consistently doubt that He had this middle knowledge unless we doubt that (1) and (2) were true."[16] Adams in fact errs in this assertion, since, as we have seen, Thomists like Alvarez, whom Adams cites, did hold to the truth of propositions like (1) and (2) and yet consistently denied middle knowledge, since they held such propositions to be true only posterior to the divine decree and so part of God's free knowledge, rather than prior to His decree and thus constitutive of His middle knowledge. In any case, Adams goes on to explain that Adams also denies the truth of the opposites of (1) and (2):

> 3. If David stayed in Keilah, Saul would not besiege the city.

> 4. If David stayed in Keilah and Saul besieged the city, the men of Keilah would not surrender David to Saul.

In Adams's view, then, none of (1)-(4) can be a true proposition.

This might lead us to think that Adams denies the Principle of Bivalence or the Law of Excluded Middle with regard to counterfactuals of freedom. But his remarks are this score are very cryptic. On the one hand, he clearly states that the case of what Saul would have done had David stayed in Keilah provides a plausible counterexample to the Law of Conditional Excluded Middle, and he endorses the exceptions to the Law enunciated by Lewis and Pollock as well. But at the same time, his analysis of what the contradictory of a counterfactual is seems to bring his position into accord with the Law. For although he refers to (3) and (4) as the "opposites" of (1) and (2), nevertheless he regards it as a mistake to say that (1) and (3) and (2) and (4) are contradictories and that one member of each pair must therefore be true. He claims that "To obtain the contradictory of a conditional proposition is [sic] not enough to negate the consequent; one must negate the whole conditional . . ."[17] In other words, the correct contradictory of $p \mathbin{\square\!\!\rightarrow} q$ is not $p \mathbin{\square\!\!\rightarrow} \sim q$, but rather $\sim(p \mathbin{\square\!\!\rightarrow} q)$. Adams appears to deny that $(p \mathbin{\square\!\!\rightarrow} \sim q) \equiv \sim(p \mathbin{\square\!\!\rightarrow} q)$. But in this case, it is difficult to understand why Adams conceives himself to be denying Conditional Excluded Middle. For that Law, properly construed, on Adams's line, would be $(p \mathbin{\square\!\!\rightarrow} q) \vee \sim(p \mathbin{\square\!\!\rightarrow} q)$. And, surely, Adams wishes to affirm the truth of the second disjunct, since he characterizes his position as holding that counterfactuals of freedom are not true.

If this interpretation is correct, then Adams also affirms Bivalence for counterfactuals of freedom: they are all false. For since "$\sim$" is a truth functional connective, $\sim(p \mathbin{\square\!\!\rightarrow} q)$ can be true only if $p \mathbin{\square\!\!\rightarrow} q$ is false. By the same token, since $\sim(p \mathbin{\square\!\!\rightarrow} \sim q)$ is true, $p \mathbin{\square\!\!\rightarrow} \sim q$ is false.

Since Adams holds that counterfactuals of freedom *cannot* be true, he apparently holds they are all necessarily false, i.e., $\sim\diamond(p \:\square\!\!\rightarrow q)$.

Adams's view of counterfactuals of freedom thus seems to be the analogue of A. N. Prior's later view of future contingent propositions: they are bivalent, false, and, when placed in properly formed contradictory pairs, governed by the Law of Excluded Middle. Still Adams never plainly asserts that counterfactuals of freedom are false, only that they cannot be true. Accordingly, one might propose other analyses of the truth status of counterfactuals of freedom, and perhaps Adams means to hold to one of these. One could hold that $\sim(p \:\square\!\!\rightarrow q)$ $\equiv (p \:\square\!\!\rightarrow \sim q)$ and simply deny Bivalence for counterfactuals of freedom. Accordingly, Conditional Excluded Middle for counterfactuals $(p \:\square\!\!\rightarrow q) \vee (p \:\square\!\!\rightarrow \sim q)$ also fails. One could regard counterfactuals of freedom as representing truth value gaps or as possessing some third truth value. Thus, one who denies that counterfactuals of freedom are true could hold that such propositions either (i) lack any truth value, (ii) possess some third truth value, or (iii) are universally false.

But why should we say that counterfactuals of freedom cannot be true? After all, such propositions are firmly embedded in ordinary discourse and we constantly act on their presumed truth or falsity. "If the accused were the murderer, he would have fled the scene." "If he really loved you, he wouldn't treat you this way." "If the Sandanistas were to invade Honduras, the President would commit American troops." Indeed, in many cases we think that we have definite knowledge of such propositions, even if in other cases we may be less confident of our knowledge of their truth. Why, then, should we say that it is *impossible* that any such propositions be true?

Adams feels the force of this consideration, commenting, "Probably the most serious grounds for misgivings about my argument may be found in cases in which we seem to have confidence in what looks like a piece of middle knowledge."[18] Here again Adams blurs important lines of distinction, however, since to be an item of middle knowledge, a piece of counterfactual knowledge would have to be known logically prior to God's decision to actualize a world, and we certainly do not have experience of cases like that. Rather the issue concerns cases in which we have confidence in our belief that some counterfactual of freedom is true. Adams confesses perplexity concerning a proposition like

> 5. Had I asked him, the butcher would have sold me a pound of ground beef,

a proposition about which there "does not normally seem to be any uncertainty at all."[19] According to Adams, there are only three al-

ternative views which one might take of this case: (i) the butcher
would only *probably* have sold me the meat, had I asked him (though
we normally ignore the minute chance that he would have refused);
(ii) the butcher would certainly have sold me the meat, had I asked
him (because he was causally determined to do so by his character
and dispositions); or (iii) the butcher would certainly have sold me
the meat (because his character and dispositions, while not causally
determinative, do render it absolutely certain that he would have
complied). Adams rejects (iii) because he assumes that what is not
causally determined by one's character and dispositions cannot be
rendered absolutely certain by them. Since Adams seems sympa-
thetic to free will, he would probably also reject (ii). He would
therefore prefer to say that in cases like (5), the consequent is only
probable given the truth of the antecedent, though we for practical
purposes ignore the slight chance of the opposite's being the case.
But what does it mean to assert that

> 5.´ Had I asked him, the butcher would probably have sold me
> a pound of ground beef

Is this not just an elliptical and colloquial way of saying that (5)
is probably true? And in that case the probability is a matter of
epistemic confidence, not of truth; (5) is either true or false, but
we call it probably true or probably false according to the varying
degrees of confidence we have in its truth or falsity. Adams, however,
disagrees. He does not understand (5´) to be the claim that (5) or,
for that matter, any other proposition *is* probable. Rather it is the
claim that

> 6. The butcher will sell me a pound of ground beef

*would* be probable given facts that would definitely obtain if I were
to ask him to sell me the meat. While "probably" is admittedly an
epistemic term, it is used in (5´) primarily to characterize disposi-
tions toward the truth of (6) that there would be if I were to ask the
butcher for the meat. Propositions like (5´) are true by virtue of cor-
respondence with the intentions, desires, and character of the agents
involved and are enough for us to act on, if we are prudent; but they
are insufficient for the partisan of middle knowledge, since God must
have certainty that the state of affairs described in the consequent
would obtain if the antecedent state of affairs were to obtain, not just
that it would probably obtain.

Adams's position would thus appear to be that in this case it is
true that

9. The butcher might or might not have sold me the meat, had I asked him

but that in view of the butcher's character and the dispositions that would obtain were I to ask my question, we can have a high degree of confidence that the possibility that the butcher will not sell me the meat is negligible, so negligible in fact that I am now pragmatically justified in asserting

5. Had I asked him, the butcher would have sold me a pound of ground beef.

What is probable is not the consequent in its subjunctive mood, but the consequent in its indicative mood. Hence, on Adams's view, true counterfactuals have the form $\phi \;\square\!\!\rightarrow$ Probably $\psi$, the "$\square\!\!\rightarrow$" being read as "If it were the case that __, then it would be the case that __, the blanks being filled by indicative sentences.

In assessing Adams' proposal, we may discount alternative (ii) above, since we are assuming that some human choices are significantly free. But what of alternative (iii)? Adams's own statement of this alternative strikes me as misleading: the butcher's "character and dispositions would not have causally determined his action, but they render it absolutely certain that he would have complied with my request."[20] The modern Molinist would agree with the main clause of this explication, but would demur at the subordinate. For certainty is not a property of propositions—unless one means thereby "necessity," in which case we no longer have a counterfactual of freedom, but an entailment—, but an epistemic property characterizing a person's attitude toward a proposition; for example, "I am absolutely certain that the butcher would have sold me the meat." But in order for (5) to be true one need not be absolutely certain of its truth; indeed, one may have no inkling at all whether or not it is true. On the popular possible worlds interpretation of the truth conditions for counterfactual propositions, all that is required for the non-vacuous truth of (5) is that in the sphere of antecedent-permitting possible worlds most similar to ours all worlds in which the antecedent is true are worlds in which the consequent is also true. Thus, absolute certainty has nothing to do with the truth of (5).

But Adams might insist that we are trying to explain precisely why we are absolutely certain of (5) and that one alternative is to say that true counterfactuals have the form $\phi \;\square\!\!\rightarrow$ Certainly $\psi$, though $\phi$ is not causally sufficient for $\psi$; but that this is unintelligible because $\psi$ cannot be made certain by $\phi$ apart from causal determination. But this begs the question by assuming Adams's own analysis of the correct form of probability judgements concerning counterfactuals. The

Molinist would assert that the proper form of (5) is Certainly $(\phi \mathbin{\square\!\!\rightarrow} \psi)$. The truth of $\phi \mathbin{\square\!\!\rightarrow} \psi$ is independent of our epistemic certainty of its truth, but we may feel certain that it is true; in the case of (5) we feel certain of the counterfactual's truth because the butcher's character and dispositions are such that we are confident that if we were to ask, then he would comply. It is important to note that our certainty of this truth is *not* incompatible with the truth of

> 8. If I had asked, the butcher could have refused to sell me a pound of ground beef.

The truth of (5) is incompatible with the truth of

> 9. If I had asked, the butcher might not have sold me a pound of ground beef.

But this is because $\phi \mathbin{\diamond\!\!\rightarrow} \psi$ is defined as $\sim(\phi \mathbin{\square\!\!\rightarrow} \sim\psi)$; in this technical sense, then, if (5) is true, then (9) is false. This is not deterministic, however, since (8) remains true; the butcher could have not sold me the meat, though it is false that he might have not sold me the meat, that is, that it is true that he would have sold me the meat. He *could* have refused to sell me my pound of *Fleisch*, but he *would* not have refused. When we keep in mind this technical sense of "might," the intuitive appeal of Adams's (7) begins to dissipate. For while if (5) is true, (7) is false, nevertheless it is still true that

> 10. The butcher could have or could have not sold me the meat, had I asked him.

The butcher's response would have been a free act of the will and therefore could have been different than what it would in fact have been, had I asked him. Indeed, in some worlds, he does refuse when I ask him; but these worlds are less similar to the actual world than worlds in which he complies and so belong to a more distant sphere, which is not relevant to the truth of the counterfactual in question. Therefore, it seems to me that Adams is unjustified in his rejection of (iii), when (iii) is correctly understood to mean that we feel highly confident on the basis of the butcher's character and dispositions that if we had asked him, he would have sold us the meat.

As for Adams's preferred alternative (i) that the proper form of a counterfactual which we regard as true is not Probably $(\phi \mathbin{\square\!\!\rightarrow} \psi)$, but $\phi \mathbin{\square\!\!\rightarrow}$ Probably $\psi$, Plantinga has argued that what serves as a basis for action is the (high) probability of a counterfactual, not the (high) probability of its consequent on its antecedent (together with background knowledge).[21] When deciding to embark upon a course of action, what one needs to know are the probabilities of the relevant

counterfactuals; knowledge of the probabilities of their consequents on their antecedents is useful only as it contributes to one's knowledge of the probabilities of the counterfactuals themselves. Suppose, says Plantinga, I know that the probability is high that

>   11. If I were to invest in Associated Computer Stocks, I would realize a ten-fold return.

But suppose I also know that the probability of its consequent on its antecedent is low. The correct decision in such a case would be to invest, for what is relevant here is the probability of the whole conditional, not of its consequent on its antecedent. If it be objected that it is impossible for the probability of the entire conditional to diverge from that of its consequent on its antecedent, Plantinga has but to point out that on Adams's view such divergence must be possible. For since counterfactuals of the form $\phi \,\square\!\!\rightarrow\, \psi$ or $\phi \,\square\!\!\rightarrow\, \sim\!\psi$ are necessarily false, the probability of $\phi \,\square\!\!\rightarrow\, \psi$ or $\phi \,\square\!\!\rightarrow\, \sim\!\psi$ is zero. If then the probability of the consequent on the antecedent cannot diverge from that of the conditional, then for any counterfactual of freedom the probability of the consequent on the antecedent is also zero. Therefore, whether these probabilities can diverge or not, Adams's proposal fails as an analysis of the confidence ordinary language speakers repose in the truth of counterfactuals like (5).[22]

It seems to me then that we often do have a high degree of confidence in our conviction that certain counterfactuals of freedom are true and that many of our decisions are based on the probable truth of such counterfactuals. Adams has failed to impugn this assumption or to offer a plausible alternative account of our confidence in the truth of such counterfactuals and our use of them in decision-making.

But if our confidence in and reliance on such counterfactuals of freedom suggests a *prima facie* plausibility to the position that they are bivalent and some are true, are we then committed to affirming the Law of Conditional Excluded Middle, to which there seem to be convincing counter-examples? That all depends on the formulation we give to the Law. If we deny the equivalence $p \,\square\!\!\rightarrow\, \sim\!q$ and $\sim\!(p \,\square\!\!\rightarrow\, q)$, then the Law holds that $(p \,\square\!\!\rightarrow\, q) \vee \sim\!(p \,\square\!\!\rightarrow\, q)$, and the counter-examples are not exceptions to the Law after all, since they are instances of the second disjunct. In cases when it is neither true that $p \,\square\!\!\rightarrow\, q$ nor $p \,\square\!\!\rightarrow\, \sim\!q$, it would still be true that $p \,\square\!\!\rightarrow\, q$ $\vee \sim (p \,\square\!\!\rightarrow\, q)$ and true that $(p \,\square\!\!\rightarrow\, \sim\!q) \vee \sim\!(p \,\square\!\!\rightarrow\, \sim\!q)$, and in both cases the second disjunct is to be affirmed. The Law would then still remain valid.

On the other hand, if we affirm that $\sim(p \mathbin{\square\!\!\rightarrow} q) \equiv (p \mathbin{\square\!\!\rightarrow} \sim q)$, then the Molinist may take either of two tacks: (i) he may deny that the counter-examples express propositions and that the Law of Conditional Excluded Middle is therefore not violated. If the sentences in the counter-examples are ambiguous or otherwise ill-formed, it could be plausibly maintained that they fail to express propositions and therefore do not constitute exceptions to the Law.[23] Take, for example, Lewis's counter-example:

> 12. If Bizet and Verdi were compatriots, then Bizet would have been Italian.

It might be reasonably maintained that (12) is so inappropriately vague that it does not express a proposition and so is neither true nor false. What is true or false are the propositions

> 13. If Bizet and Verdi were both French, then Verdi would have been French

and

> 14. If Bizet and Verdi were both Italian, then Bizet would have been Italian

or perhaps

> 15. If Bizet and Verdi were compatriots, they would both have been either French or Italian.

One could thus preserve the Law of Conditional Excluded Middle by insisting that only appropriately formed sentences express propositions governed by the Law. (ii) The Molinist may simply deny the universality of the Law for counterfactual propositions while insisting that a sufficient number are governed by the Law to facilitate divine providence and prescience. Again this strikes me as unobjectionable. The proffered exceptions to the Law are of such an odd character that their failure to possess a truth value need not impinge sufficiently on divine middle knowledge so as to hamper the divine planning or foreknowledge. One could maintain that "normal" counterfactuals of freedom are either true or false, regardless of the exceptions, and it is these in which we repose our confidence and which guide God's decision-making as well. Thus, in this vein, Flint and Freddoso assert that for any proposition which can be expressed by a sentence of the form

> 16. If individual essence $P$ were instantiated in circumstances $C$ at time $t$ and its instantiation were left free with respect to action $A$, the instantiation of $P$ would freely do A

either that counterfactual or its negation is true.[24] The truth of (16)

would be sufficient for God's purposes without requiring the truth of counterfactuals like

> 17. If Suarez had scratched his beard at 9:00 a.m. on April 1, 1588, then Freddoso would have scratched his head at 4:00 p.m. on April 1, 1988

in which the consequent seems utterly unrelated to the antecedent. One could deny the truth or falsity of propositions like (12) or (17) without denying the truth or falsity of propositions of the form of (16) or impugning divine providence or prescience based on middle knowledge of such counterfactuals of creaturely freedom. Of course, one might need to stipulate "$C$" to an arbitrary degree of fullness in order to get a proposition of the form of (16) to be true or false, but that represents no difficulty for the Molinist, since by His natural knowledge God can envision any possible set of circumstances. Indeed, if $C$ were fully specified up to the moment of $P$'s decision, then it seems plausible that $P$ must either do $A$ or not do $A$, for no other alternative remains. Therefore, his commitment to the truth of certain counterfactuals of creaturely freedom does not require the defender of middle knowledge to hold to the Law of Conditional Excluded Middle, though he may do so, if he wishes, by formulating it as $(p \mathbin{\Box\!\!\rightarrow} q) \vee \sim (p \mathbin{\Box\!\!\rightarrow} q)$ or by denying that all counterfactual sentences express propositions.

What reasons might be given then for denying that propositions of the form of (16) are true? On this score, Adams presents two indictments of the possible worlds explanation of the truth of counterfactuals in order to show that that explanation "does not really give us a new solution to our problem about the truth of the crucial conditionals," but "merely offers us a new and up-to-date form for the expression of attempted solutions that we may already have considered and rejected."[25] (i) Lack of sufficient, relevant criteria for similarity among worlds: according to the possible worlds analysis a counterfactual conditional is non-vacuously true iff in all worlds which are most similar to the actual world and in which the antecedent is true, the consequent is also true. But what determines which worlds are most similar? In Adams's opinion, a world in which Saul acts out of character and does not besiege Keilah and in which subsequent history goes on pretty much as it did is more similar to the actual world than is a world in which Saul besieges Keilah and kills David. But, Adams continues, I would not therefore conclude that if David had stayed in Keilah, Saul would not have besieged the city. Thus, some similarities between worlds are just irrelevant to the truth of counterfactuals. Those similarities that are relevant—causal laws

and people's characters—are not sufficient to found the truth of the crucial conditionals, so long as the agents involved are truly free. (ii) Inconsistency between human freedom and relevant criteria of similarity: we have a well entrenched belief that even though a person probably *would* have acted in a certain way, still he *might* not have so acted. This belief is to be accorded more weight than the belief that the worlds which are most relevantly similar to the actual world are worlds in which the causal laws and a person's character indicate that he would have acted in a certain way. If the possible worlds analysis leads us to conclude that it is false that a person might not have acted differently, then that only gives grounds for rejecting the possible worlds analysis.

Now these considerations raised by Adams seem relevant, not so much to the truth of counterfactual conditionals, as to the adequacy of the possible worlds analysis of the truth conditions of such conditionals. But the Molinist is under no obligation to accept the currently fashionable possible worlds account. The analysis of counterfactual conditionals has been a very knotty problem and a number of alternative accounts exist; we have no reason to think that a final, satisfactory analysis has been struck out. The defender of middle knowledge could claim, with some justification I think, that he is more certain that some counterfactuals of freedom are true than he is of the adequacy of the possible worlds account of their truth conditions. Even if Adams's objections to that account were sound, that would not imply that counterfactuals of freedom cannot be true.

But, in fact, are Adams's objections cogent? It would seem not. (i) The ambiguity of the relevant criteria of similarity is, of course, a very well-known feature of the possible worlds account, with which proponents of that account have wrestled.[26] Plantinga,[27] for example, invites us to consider two worlds $W$ and $W^*$ in which the antecedent of some counterfactual is true and which have identical initial segments up to some time $t$, at which the worlds diverge in virtue of the fact that the consequent of the counterfactual is true in $W$ but not in $W^*$. In such a case, both worlds would seem equally close to the actual world up to $t$ (what happens after $t$ can hardly be relevant to what would have happened at $t$ had the conditions in the antecedent obtained), so that neither $p \mathbin{\Box\!\!\rightarrow} q$ nor $p \mathbin{\Box\!\!\rightarrow} {\sim}q$ is true. The defect of this argument against the truth of the counterfactuals in question may be seen by means of an illustration, says Plantinga. Suppose Royal Robbins is climbing El Capitan, nearly slips, but regains his balance and continues to the top. No doubt we should accept the truth of the proposition

18. If Robbins had slipped and fallen, he would have been killed.

But what happens in the closest worlds in which he does slip and fall? In some world $W'$, the instant after he falls, he miraculously appears exactly where he was at that instant in the actual world and continues his climb to the top just as he did in the actual world. Would not $W'$ be much more like the actual world than a world in which Robbins falls to his death? And if so, is not (18) false? Plantinga answers that such a scenario neglects causal or natural laws. In $W'$ not all of the natural laws operative in the actual world are operative there, since Robbins miraculously did not fall. Therefore, $W'$ is not so similar to the actual world after all, since the same laws did not hold in $W'$. But Plantinga notes an intriguing consequence of such an answer. A salient feature of causal laws is that they support counterfactuals. To give an example of our own,[28] when Einstein completed his field equations for the General Theory of Relativity, he discovered to his dismay that they predicted an expanding universe. To rectify this he introduced his cosmological constant into the equations. But de Sitter showed that the field equations could hold for a static universe, so long as that universe was *empty*. Should matter be introduced into the model universe, it would begin to expand. Thus, the laws of General Relativity supported counterfactuals such that models in which the material universe is expanding are more similar to the empty de Sitter universe than are models in which the universe, whether empty or full, is static. Hence, instead of claiming that $W'$ differs in its natural laws from the actual world, we could with equal justification have said $W'$ lacks some of the actual world's counterfactuals. Thus, one measure of similarity between worlds is the degree to which they share their counterfactuals. So in the case at hand, even if $W$ and $W^*$ are equally similar to the actual world. For one measure of similarity will be the degree to which each shares the same counterfactuals with the actual world. If $p \mathrel{\Box\!\!\rightarrow} q$ is true in the actual world, then whichever of $W$ or $W^*$ shares that counterfactual will, all things being equal, be most similar to the actual world.

Since sharing counterfactuals is itself thus a criterion of similarity, it might seem that the possible worlds account of the truth conditions of counterfactuals in terms of truth in the most similar possible worlds is viciously circular or trivial. But this Plantinga denies, commenting that it only follows that ". . . we cannot as a rule *discover* the truth value of a counter-factual by asking whether its consequent holds in those worlds most similar to the actual world in which its antecedent holds."[29] In a similar way, Adams's difficulty seems to be that he is looking to the possible worlds account for a reason *why* certain counterfactuals are true or false, and that account fails to provide

any. But that account is not to be construed as explaining why certain counterfactuals are true or false; it only means to provide an account of what it is for a counterfactual to be true or false. Plantinga draws an instructive comparison in this regard between the possible worlds account of the truth conditions of counterfactual conditionals and the possible worlds account of the modal concepts of necessity and possibility:

> Of course . . . we can't look to similarity, among possible worlds, as explaining counterfactuality, or as *founding* or *grounding* it. (Indeed, any founding or grounding in the neighborhood goes in the opposite direction.) We can't say that the truth of $A \rightarrow C$ is *explained* by the relevant statement about possible worlds, or that the relevant similarity relation is what *makes* it true. But it doesn't follow that the possible worlds account of counterfactuals is viciously circular or of no use. In the same way we can't sensibly *explain* necessity as *truth in all possible worlds*; nor can we say that $p$'s being true in all possible worlds is what *makes* $p$ necessary. It may still be extremely useful to note the equivalence of *p is necessary* and *p is true in all possible worlds*: it is useful in the way diagrams and definitions are in mathematics; it enables us to see connections, entertain propositions and resolve questions that could otherwise be seen, entertained and resolved only with the greatest difficulty if at all.[30]

Since counterfactuals themselves help to determine similarity between worlds, Adams's objection based on the lack of sufficient, relevant criteria of similarity among worlds for founding the truth of counterfactuals is misconceived.

As for (ii), we have already seen that the "might" counterfactual is technically defined as the negation of $\phi \;\square\!\!\rightarrow\; \sim \psi$ so that $\phi \;\square\!\!\rightarrow\; \sim\psi$ and $\phi \;\diamond\!\!\rightarrow\; \psi$ are logically incompatible, but that it still remains true that if $\phi$ were the case it *could* be the case that $\sim \psi$, and this is what our intuitions support. If there is some ambiguity in a counterfactual of freedom concerning what $P$ would do, it may be plausibly maintained that such ambiguity is resolved by specifying $C$ fully. So long as $P$ could act differently than he would act, it is irrelevant for considerations of human freedom whether he might act differently. Hence, our well entrenched belief in $P$'s freedom will not lead us to reject the possible worlds analysis of the truth conditions of counterfactuals nor the truth of relevant counterfactuals of freedom.

Now Adams would probably at this point concur with what has been said, adding that the inability of the possible worlds account to explain why counterfactuals of freedom are true only underscores his misgivings, since it provides no explanation of what makes counterfactuals true or false. Thus, he complains, "Counterfactuals of freedom . . . are supposed to be contingent truths that are not caused to be

true by God. Who or what does cause them to be true?"[31] Plantinga finds himself rather non-plussed by such a query, remarking, "It seems to me much clearer that some counterfactuals of freedom are at least possibly true than that the truth of propositions must, in general, be grounded in this way."[32] But even if we concede that propositions must be thus grounded, Plantinga opposes a theological consideration to Adams's objection: surely there are true counterfactuals of freedom about God. God surely knows what He would have done had one of His creatures acted or reacted to Him differently. "And if counterfactuals about God can be true even if their antecedents neither entail nor causally necessitate their consequents, why can't the same be true for similar counterfactuals about other persons?"[33] I imagine that in response to this theological consideration, Adams would simply affirm that in cases in which God's moral nature does not entail certain actions, God does not know what He would do were one of His creatures to behave differently. In the examples offered by Plantinga, God does know what He would do because He is perfectly just and loving; for example, He knows that if Adam and Eve had not sinned, He would not have punished them, since it would be evil to punish innocent creatures. On the other hand, if Adam and Eve had acted differently in some a-moral act, then Adams would probably bite the bullet and deny that God knows how He would have acted in response. On Adams's view, God could *decide* how He would act if creatures were to act differently and He could be aware of His decision to so act, but He could not believe that He would in fact so act, since such a belief might be erroneous. This strikes me as a pretty attenuated omniscience, but it is difficult to see how one could drive Adams from this stronghold should he seek it. But then again, who is on the defensive here? We have good grounds *prima facie* for regarding some counterfactuals of freedom as true and theological grounds for affirming God's knowledge of some such counterfactuals, so even if we cannot answer the question as to what makes counterfactuals true, that does not prove that they *cannot* be true, for it may well be the case that our philosophical analysis is just not yet up to the task of answering this question. The Molinist defense of the compatibility of divine foreknowledge and human freedom requires only that it is possible that such counterfactuals are true and known to God prior to His decree. Adams's questions do not show this account to be impossible.

But, in fact, it does seem to me obvious what makes counterfactuals of freedom true; they are true in virtue of what makes any non-truth functional proposition true, namely, correspondence. Tarski's

T-schema for truth, $Tp \equiv p$, applies to counterfactuals as it does to any atomic proposition. The proposition "If I were rich, I should buy a Mercedes" is true in virtue of the fact that if I were rich, I should buy a Mercedes. True counterfactuals correspond to reality and are therefore true; false counterfactuals fail to correspond and are therefore false. Hence, I think Plantinga is on the right track when he asserts that what makes the proposition "Yesterday I freely did $A$" true is that yesterday I freely did $A$, and that the same response is available in the case of counterfactuals.[34] What grounds the truth of a counterfactual conditional is correspondence.

Now it might be contended that correspondence cannot be relevant in the case of counterfactual conditionals because neither the antecedent nor the consequent need obtain in the actual world. But this objection commits the same error as does a misguided objection against the truth of future contingent propositions. At the time at which future contingent propositions are true, the events to which they refer do not exist; but all that is required for the truth of such propositions is that the relevant events *will* exist at the specified time. Similarly, in order for a counterfactual of freedom to be true, it is not required that the events to which they refer actually exist; all that is required is that they *would* exist under the specified conditions. The objector to the truth of counterfactuals seems to be presupposing the same wooden understanding of truth as correspondence as does the opponent of the truth of future contingent propositions.

It might be said that correspondence is well and good for conditionals concerning actually existent individuals, but for merely possible persons there can be no such true conditionals, since there are no such merely possible objects. This objection, however, only reiterates Prior's argument against true propositions concerning not yet existent, future individuals, and the answer is essentially the same. As (16) showed, counterfactuals can be cast in terms of what the exemplification of some individual essence would do if it were instantiated in a set of circumstances and left free. One has only to stipulate the individual's essence one has in mind and specify the circumstances to an arbitrarily full degree in order to get a counterfactual proposition expressed by a sentence about a merely possible individual that corresponds to reality and is therefore true.

I think the reason Adams does not see this rather obvious answer to his question is that he misconstrues the question in terms of causal relations. Thus, he asks who or what *causes* the counterfactual to be true. Seeing that God does not cause such a proposition to be true nor the agent referred to in the counterfactual itself, Adams is at a

loss to explain who does cause it to be true. This was also the heart of the traditional Thomist complaint about middle knowledge. Thus, Anton Pegis asserts, "The mystery is that in *scientia media* human choice exists without ever having been caused by either God or the creature,"[35] and Gerard Smith declares that the "unanswerable difficulty" of Molinism is, how can the futurible be *there* unless God causes it?[36] But this line of questioning is simply wrong-headed. It mistakenly assimilates the semantic relation between a true proposition and the corresponding actual state of affairs to the causal relation. We saw the same error committed by those who thought the truth of future contingent propositions entails backward causation. But the correspondence relation is not causal. To provide just one illustration: imagine an empty universe. In such a case the proposition "No material universe exists" is true. But who or what causes this proposition to be true? If we take causation seriously, it is evident that there is no cause of this proposition's being true, for nothing cannot cause anything. The proposition just is true in virtue of the fact that its corresponding state of affairs obtains. Similarly a counterfactual is true in virtue of the fact that its corresponding counterfactual state of affairs obtains. There is thus a reason why the counterfactual is true; its truth has a ground or is founded, if you will; and that reason or ground is its correspondence with reality. But it is misguided to ask who causes it to be true.

Now someone might say that such an answer merely pushes the question back a notch. For now we may ask, why does the counterfactual state of affairs, in virtue of which a counterfactual proposition is true, obtain? Since neither God nor any finite agent causes the state of affairs to obtain, why does it obtain? But again, this question, upon analysis, can be seen to be misguided. It implicitly assumes that libertarianism and agent causation, which counterfactuals of freedom presuppose, are in fact false doctrines. To see the point, consider the libertarian claim "Jones freely chose *x*." If a compatibilist were to demand what causes this proposition to be true, the libertarian might well respond that nothing causes it to be true, that it simply is true in virtue of the fact that Jones freely chose *x*. But the compatibilist will press him further by demanding why that state of affairs obtains. If Jones's choice was undetermined, then why did not some other state of affairs obtain, say, Jones's freely choosing *y*? Who or what caused Jones to freely choose *x*? The libertarian at this point will respond that the compatibilist has missed the whole point. For on the hypothesis of the liberty of indifference there is no cause of Jones's freely choosing *x*, to ask for that is implicitly to deny the

very liberty the libertarian assumes. As a free agent, Jones himself is the cause of his choice and there is no further cause explaining why Jones freely chose $x$, rather than $y$. To assume that there must be such is to deny Jones's liberty.

But similarly, in the case of the counterfactual proposition, "If Jones were in $C$, he would freely choose $x$," this proposition is true in virtue of the fact that the counterfactual state of affairs it describes obtains. But now to ask, "What is the cause of the fact that if Jones were in $C$, he would choose $x$?" implicitly denies Jones's liberty as much as the compatibilist's query above. This state of affairs obtains because Jones *would* freely choose $x$ if he were in $C$. There is no further cause of why Jones would freely choose $x$ if he were in $C$. To think that there must be such is to deny the hypothesis of Jones's freedom. Hence, the question as to what causes the counterfactual state of affairs to obtain is simply misdirected. Given agent causation and liberty of indifference, there is and can be no further cause as to why a state of affairs described in a counterfactual of freedom obtains.

Notice, *pace* Adams, that this is not to say that such counterfactual states of affairs just *happen* to obtain, as though what an agent would freely do is independent of his choice.[37] Such an allegation is analogous to the compatibilist's charge that if one's choices are not determined by further causes, then they are random happenings like the motion of a subatomic particle. The problem with these claims, once again, is that they implicitly deny agent causation, which counterfactuals of freedom presuppose. "Jones will freely choose $x$" is true for no other reason than that is how Jones will choose; no reason is to be given for why Jones will freely choose that way, nor need Jones exist in order for this proposition to be true. Similarly, "Jones would freely choose $x$ if he were in $C$" is true for no other reason than that is how Jones would choose; no reason is to be given for why Jones would freely choose that way, nor need Jones exist in order for this proposition to be true.

In response, then, to the first question which we raised— are some counterfactuals of freedom true?—, I think we can conclude (i) counterfactuals of freedom are deeply embedded in our discourse and decision-making and some deserve *prima facie* to be regarded as true, (ii) probability considerations concern our epistemic relation to such propositions, not their truth values themselves, (iii) adherence to the truth of counterfactuals of freedom does not entail adoption of the Law of Conditional Excluded Middle, though that Law might be construed so as to make it acceptable, and (iv) objections to the truth of counterfactuals of freedom based on problems concerning similarity

among possible worlds fail to appreciate that the degree of shared counterfactuals is itself a measure of similarity, and (v) objections based on the question of what makes a counterfactual of freedom true misconstrue the relation between a proposition and a state of affairs, presuppose a wooden understanding of truth as correspondence, and deny the very liberty of indifference which such counterfactuals presuppose.

## Are Counterfactuals True Prior to God's Decree?

The truth of counterfactuals of freedom is not enough, however, to establish the fact of middle knowledge, for now we must address the second of the questions raised by the Thomist objections: are counterfactuals of freedom true prior to the divine decree? According to the Thomistic view, counterfactuals of freedom are indeed true and part of God's free knowledge. But logically prior to His divine decree to create the universe, such counterfactuals were devoid of truth value and so could not be known by God. Once again, the opponent of middle knowledge must present an argument to show that it is impossible for such propositions to be true in that logically prior moment. Why, then, cannot counterfactuals of freedom be true prior to God's decree?

Adams again speaks to this issue, claiming that "the truth of the crucial conditionals cannot be settled soon enough to be of use to God."[38] In order to make his point, he draws attention to a subclass of subjunctive conditionals which he calls "deliberative conditionals." Such conditionals are entertained in the context of decision-making about whether to make the antecedent true or false. Consider, for example,

19. If I were to start smoking, I should contract cancer.

When I entertain (19), I am deliberating about whether to make the antecedent true or false. Hence, I am committed to the position that the truth of (19) is independent of the truth or falsity of its antecedent. But the problem is that the truth of (19) depends on which is more similar to the actual world: a world in which I smoke and contract cancer or any world in which I smoke and do not contract cancer. And the actual world is determined in part by whether I start smoking. Thus, the truth of (19) depends on the truth or falsity of its antecedent. One might expect Adams to conclude at this point that the possible worlds account of deliberative conditionals is self-contradictory, but he does not. Rather he concludes that God

in deliberating which world to make actual is therefore entertaining propositions whose truth depends on some world's already being actual.

Adams's point seems to be this: the subjunctive conditionals which God entertains as truths to guide Him in His deliberation of which world to actualize can be true only if a world already obtains in which the antecedent is true. But then it is too late for God to use such conditionals in His decision-making.

But this analysis is very confused and multiply flawed: (i) As already pointed out, what the actual world is like subsequent to the decision can be considered irrelevant to considerations of similarity between worlds. One need only consider world-segments up to the time of the decision in order to see which worlds are most similar to the actual world. Hence, the truth of (19) does not depend on whether the antecedent is true. (ii) Since shared counterfactuals are themselves a measure of similarity between worlds, it follows that if (19) is true, then worlds in which (19) is true may be closer to the actual world regardless of whether there are worlds in which the antecedent has the same truth value as it does in the actual world, but (19) as a whole does not. (iii) Plantinga points out that Adams's use of "depends" is equivocal.[39] It is true that the truth of a counterfactual conditional depends on which world is actual in the sense that a conditional will be true in some worlds but false in others; that is to say, $\phi \,\square\!\!\rightarrow\, \psi$ is non-vacuously true in a world $W$ iff all of the most similar $\phi$-worlds to $W$ are also $\psi$-worlds. Counterfactuals are thus true or false relative to a world. Now it is also true in another way that which world is actual depends on whether the antecedent of a counterfactual is true, in the sense that the antecedent is true in some worlds but false in others; that is to say, which world is actual depends on which states of affairs obtain and, hence, which propositions are true. But obviously, from all this it does not follow that the truth of a counterfactual depends on the truth of its antecedent. Otherwise, the truth of a counterfactual could be said to depend on any proposition true in the actual world. Adams is conflating two different types of dependency in his objection.

Perhaps a clearer version of Adams's objection could be had by maintaining that subjunctive conditionals concerning the future do not have the truth conditions of counterfactuals but rather the truth conditions of ordinary indicative conditionals.[40] They are false only if the antecedent is true and the consequent false. But deliberative conditionals are future subjunctive conditionals, since one is deciding what one shall do, and they, too, therefore possess the truth condi-

tions of indicative conditionals. In such a case, the truth value of the conditional is a function of the truth values of its components. But then such conditionals are true or false too late to guide God's decision-making, for the antecedent can be true or false only if the actual world already obtains.

Whatever else may be said of Lewis's analysis, the salient point here is that in the case of divine middle knowledge, deliberative conditionals are not future subjunctive conditionals. It must be kept in mind that words like "before" and "prior" are being used in a non-temporal, logical sense in this context. In that logically prior moment, the antecedents of the counterfactual conditionals contemplated by God concerning free creatures are uniformly false, for creatures do not exist at that moment nor will they exist (in the temporal sense) in relation to that moment. Hence, the counterfactual conditionals being deliberated by God cannot be treated as indicative conditionals of material implication. In such a case, they would all be true, which they are not.

But then we might seem to fall into the hands of Anthony Kenny, who argues that since counterfactuals are true or false relative to a world, it is not enough for God to know which counterfactuals are true at which worlds in order to have middle knowledge.[41] Rather He must know which counterfactuals are in fact true. But in order for certain counterfactuals to be in fact true, Kenny argues, the actual world must obtain, so as to serve as the point of reference for the calculation measurement of similarity of worlds to it. For God to actualize those parts of a possible world which He directly controls in order to actualize weakly a state of affairs not directly under His control, He would need to know the relevant counterfactuals of free-dom with regard to those parts. But these counterfactuals cannot be known prior to the exemplification of the actual world, for their truth value depends on which world is actual. The problem is that what makes the counterfactuals true does not yet obtain at any stage at which it is undecided which world is actual. The defender of middle knowledge thus faces this dilemma: if God is to decide which world to actualize, His middle knowledge must be logically prior to His decision; but God can have middle knowledge only if the actualization of some world has already taken place.

What this objection fails to appreciate is that corresponding to the logical sequence in God's knowledge there is a logical sequence in the instantiation of the actual world as well. In the first moment of God's natural knowledge, all broadly logical necessary states of affairs already obtain. For this reason it is technically misleading to speak of

God's actualizing a possible world, for as Plantinga emphasizes, there is a wide range of states of affairs which God does not actualize:

> . . . while we may properly say that God actualizes α, it does not follow that he actualizes every state of affairs the latter includes. He does not . . . actualize his own existence; that is to say, he does not create himself. Nor does he create his own properties; hence he does not actualize the state of affairs consisting in the existence of such properties as omniscience, omnipotence, moral excellence, and *being the creator of the heavens and the earth*. But the same is really true of other properties too; God no more creates the property of being red than that of omnipotence . . . . Again, since God did not create numbers, propositions, pure sets, and the like, he did not actualize the states of affairs consisting in the existence of these things. Nor does he actualize such other necessary states of affairs as 7 + 5's *equaling* 12. Necessary states of affairs do not owe their actuality to the creative activity of God.[42]

If this is correct, then even though the actual world does not fully obtain at the moment of God's natural knowledge, it is nonetheless true that aspects of the actual world already obtain at that moment, namely, broadly logically necessary states of affairs.

In the second moment of God's middle knowledge the actual world is even more fully instantiated than at the first moment. For now all those states of affairs corresponding to true counterfactuals of creaturely freedom obtain. For example, the state of affairs *if Peter were in C, he would deny Christ three times* obtains. Of course neither Peter nor the circumstances at this point exist, and God could decide at this juncture not to create Peter at all or not to place him in those circumstances; but still the counterfactual state of affairs obtains that if this individual essence were instantiated in the actualized state of affairs envisioned, then the exemplification of that essence would deny Christ three times. Hence, at the second logical moment additional states of affairs obtain which are not actualized by God's decree.

Then comes the divine decree to create, and God freely actualizes all remaining states of affairs of the actual world. Now in the third moment, God possesses free knowledge of the actual world which is exemplified in all its fullness. (It must be kept in mind that we are speaking of a logical order here; we are not suggesting that the actual world is not instantiated serially in time.) Only at this point can the actual world as a whole be said to obtain.

Another way of seeing this logical sequence of instantiation of the actual world is to recall that broadly logically necessary truths and counterfactual truths of creaturely freedom do not depend on the decree of the divine will for their truth, but their truth logically precedes God's decision. Hence, the corresponding states of affairs in virtue

of which they are true must also logically precede the divine decree
in their obtainment. God then decides which further states of affairs
He wishes to actualize, whether strongly or weakly, and decrees that
these states be actual, and so they are. Only states of affairs depen-
dent upon God's decree for their exemplification must wait until the
third logical moment for their instantiation.

The upshot of this is that it is not wholly correct to say with Kenny
that prior to the divine decree the actual world does not obtain, for
certain aspects of it do and other aspects do not. And those states of
affairs that do obtain are sufficient for the truth of counterfactuals of
creaturely freedom, since the latter correspond with reality as it thus
far exists and since possible worlds can be ranked in their similarity
to the actual world as thus far instantiated, thus supplying the truth
conditions for a possible worlds analysis of the truth of counterfactuals
of freedom in terms of degree of shared counterfactuals. Once it is
appreciated that there is a logical sequence in the exemplification of
the actual world just as much as there is in God's knowledge, then
objections to middle knowledge based on counterfactuals' being true
"too late" to facilitate such knowledge disappear.[43]

In summary, then, neither Adams nor Kenny provides any good
reason for thinking it to be impossible for counterfactuals of crea-
turely freedom to be true logically prior to the divine decree. Since
such counterfactual states of affairs do not depend on the divine will
for their obtainment, they are instantiated already prior to that de-
cree, along with broadly logically necessary states of affairs. Hence,
propositions corresponding to them are true prior to God's decision
to create.

*Can God Have Prior Knowledge
of True Counterfactuals?*

But that takes us on to the third issue raised by the Thomist cri-
tique: even if counterfactuals of creaturely freedom are true prior to
the divine decree, is it possible for God to know their truth in that
logically prior moment? In *quo medio* does God know such proposi-
tions? We have seen that Molina and Suarez offered different answers
to this question, the first in terms of supercomprehension and the
latter in innatist terms of God's immediate apprehension of all true
propositions. What objection might be raised against these accounts?

Adams objects to the Molinist doctrine of supercomprehension on the same grounds as did Suarez.[44] To comprehend something is to understand everything about it that there is to understand, and it is absurd that anyone, even God, can understand more than that. "Molina seems to want to say that what free creatures would do under various possible conditions is not there, objectively, to be known, but that God's mind is so perfect that He knows it anyway. But that is impossible."[45] Now I think that the traditional critique of Molina, echoed by Adams, is on track here. Molina adopted the doctrine of supercomprehension chiefly because it afforded him a means of affirming God's middle knowledge concerning counterfactuals of creaturely freedom while denying His knowledge of counterfactuals of divine freedom. But even if we reject Molina's account of *super*comprehension, why can we not affirm that God comprehends an individual essence so completely that He knows what its exemplification would freely do under any circumstances? I do not see that this implies character determinism or inability to act out of character. God just knows every haecceity so intimately that He even knows when its exemplification would act out of character. This account of middle knowledge might not be sufficient to explain God's knowledge of a counterfactual like "If a photon were fired through a slit under circumstances $C$, then it would strike a target at coordinates $<x, y>$." But then the movement of the will is not like the random motion of a subatomic particle. Why could not God know counterfactuals of creaturely freedom on the basis of His complete comprehension of every creaturely essence? A full answer to this question, however, must await our discussion of the issue of middle knowledge and divine freedom.

In any case, why not adopt Suarez's alternative that God knows only and all true propositions, that some counterfactuals of creaturely freedom are true, and that therefore God simply knows innately all such propositions? This would be a conceptualist model of divine middle knowledge on the analogy of the conceptualist model of divine foreknowledge which I defended in chapter XII. Since, according to Suarez, propositions do not exist as abstract objects external to God but only in the divine mind, they are immediately present to God and known by Him to be true or false. Adams objects, "I do not think I have any conception, primitive or otherwise, of the sort of *habitudo* or property that Suarez ascribes to possible agents with respect to their acts under possible conditions. Nor do I think that I have any other primitive understanding of what it would be for the relevant subjunctive conditionals to be true."[46] Now the second of Adams's misgivings has already been solved, for we have seen what

it is for counterfactuals of creaturely freedom to be true. As for his
first confession of perplexity, he seems to ascribe an exaggerated im-
portance to one aspect of Suarez's view. In his *Tractatus de gratia
Dei*, Suarez thinks of God as positing a possible creature in His mind
in certain circumstances and then observing what the creature would
do; the creature may thus be said to have a *habitudo* to do something
were it to be put in such circumstances, and the corresponding coun-
terfactual is thus true and known by God. The notion of the *habitudo*
really amounts to a counterfactual state of affairs' obtaining, in virtue
of which the relevant counterfactual is true. The emphasis is on the
truth or falsity of such counterfactuals, and Suarez makes no use the
notion of *habitudo* in his treatise *De scientia Dei futurorum contin-
gentium*, where he simply appeals to the Law of Conditional Excluded
Middle to prove that counterfactuals of freedom are true and, hence,
knowable by a sufficiently powerful intellect. Adams says nothing to
show the impossibility of such an innatist account of divine middle
knowledge. Again it is up to the detractor of divine middle knowledge
to prove that it is impossible, not merely to ask how it is possible,
if that doctrine is to be rejected as a possible solution to problems
pertinent to divine omniscience and human freedom.

Gayraud's own objections to Suarez's view seems to be based on
misconceptions: (i) it is indeed correct that indicative, logically con-
tingent propositions are not true or false in the second moment of
God's knowledge, but that says nothing against the truth of coun-
terfactuals of freedom at that point; (ii) while creatures depend on
God's decree for their instantiation, counterfactual states of affairs
about how they would freely act under various circumstances do not,
(iii) if a disjunction of two contradictory counterfactuals is true, then
it is necessary that one be true and the other false. *In quo medio* does
God know one and not the other?—the divine intellect, immediately
and innately.

Hence, in summary it seems that with regard to the three ques-
tions raised by the principal traditional objection to divine middle
knowledge—that middle knowledge is impossible because it lacks any
object—we may conclude: (1) some counterfactuals of creaturely free-
dom are plausibly regarded as true, and there is no good reason to
deny this, (2) such counterfactuals are true logically prior to the di-
vine decree in virtue of the obtaining of certain states of affairs of
the actual world already at that point, and (3) neither Molina nor
Suarez's account of how God knows such counterfactuals has been
shown to be impossible. Hence, this first and most important objec-
tion is seen to be inconclusive.

## Middle Knowledge and Passivity in God

Let us turn then to the second of the traditional objections raised
against the doctrine of divine middle knowledge: that such knowl-
edge posits passivity in God. According to Thomist teaching, divine
knowledge is the cause of its objects of knowledge. By this seemingly
peculiar doctrine Aquinas apparently meant no more than that what
possibilities are actualized is the result of the divine decree, which
Thomas denominated a sort of knowledge, *scientia approbationis*.[47]
Molina did not, quite correctly it would seem, consider God's decree a
type of knowledge, but an act of will, and, hence, he denied that God's
knowledge is the cause of things. God's knowledge can be called a
cause of things only in the sense that the decree to actualize a world
presupposes God's natural and middle knowledge. Thomists, how-
ever, have insisted that God's being First Cause and Pure Actuality
require that God Himself must determine the truth of every propo-
sition that He knows, or these divine properties would be abrogated.
Thus, R. Garrigou-Lagrange argued in a protracted debate with the
Molinist A. d'Ales that middle knowledge would constitute an ex-
ception to divine universal causality and introduce passivity in God,
since conditional futures are determined by themselves, not God.[48]
God could not be said to be the universal cause because we ourselves
are said to cause our own acts of will. This is why both Molina and
Suarez rejected the proof for an unmoved First Mover based on the
principle *quidquid movetur ab alio movetur*. Such a denial of God's
universal causality is said, furthermore, to have unacceptable theo-
logical consequences: God is not the cause of a person's conversion,
for one man may resist and another man accept the same grace. In
that case the conversion of Paul is no more the work of God than
the betrayal of Judas! Man also becomes the source of his own good
works, leading to salvation based exclusively on human merit. Not
only is God's universal causality violated by Molina's doctrine, but
also God's status as Pure Actuality is said to be compromised be-
cause God does not Himself decree what a free agent would do in any
set of circumstances, but, as it were, merely sits by like a helpless on-
looker and sees what would happen. But that means, for example,
that if God by His middle knowledge knew that Peter would deny
Christ if placed in the proper circumstances, then there was nothing
God could do to stop Peter's betrayal the night of Jesus's passion.
By contrast, the Thomistic view holds that God Himself is the cause
of the motions of the will on the part of free creatures and therefore
causes everything that happens. God knows future contingents be-

cause He knows the decree of His will that these shall happen. His knowledge of conditional future contingents is based on what He decrees would be the case under different circumstances. By His own will God determines, in effect, which counterfactual propositions are true or false. Garrigou-Lagrange concludes that there are only two alternatives: *Dieu determinant ou déterminé*:

> God *determines* or he is *determined*, there is no in-between; either *things* are the measure of the knowledge of free futuribles or else *it* is their measure by reason of the decree of the divine will which accompanies it. . . . Either God's knowledge is the CAUSE *of our free determinations* or else it is CAUSED *by them* because Peter *would* choose, if he were placed in certain circumstances, and because he *will in fact* choose when he will be so placed.[49]

For my part, however, I do not see why the Christian theist should wish to adopt the view that God is the determining cause of everything that occurs or that He is impassible actuality. God's being the First Cause does not entail His being the universal cause (nor does Thomas's First Way suggest any differently[50]). I see no reason why a Christian philosopher could not in principle affirm Heisenberg's Principle of Indeterminacy for subatomic physics and agent causation of finite acts of will. Arguments against free will based on considerations of grace could at best prove that no man would consent to God's grace unless God moved his stubborn and sinful will to do so. One might maintain that man is "bound in things above", but "free in things below", to echo Luther. In such a case, admission of counter-causal freedom in man would not undermine the doctrine of grace. More than that, however, the admission that God's grace is resistible would not seem to imply that God is therefore not the cause of a person's conversion. All that follows is that the cause is not efficacious so long as one refuses to allow it to act. One could maintain that the final, free consent of the human will is a necessary condition of salvation without holding that man thereby causes his own salvation, in the sense of being an efficient cause. God is the one who pardons and regenerates; He is the only efficient cause. Man must simply be willing to let the efficient cause do its work. Thus, the conversion of Paul was certainly God's work, since it was God who had set him apart, called him, and revealed His Son to him; all Paul did was not to resist (Acts 26.19). But in no way did God call and produce in Judas his betrayal of Christ; God's graces pulled in the opposite direction, and it was only by ignoring these and heeding Satan's temptation that Judas precipitated himself into his act of perfidy. Garrigou-Lagrange's final concern over salvation by good works serves only to expose Roman Catholicism's flawed doctrine of

justification, which attributes final salvation to the meritorious works performed by the believer.[51] If one adopts the view that our good works merit salvation, then Molinism would, indeed, seem to lead to works-righteousness on the part of man, since it is not God who does the works, but we ourselves, at God's instigation. On the Thomist view, the works are viewed as works of God to which He causally determines us, and therefore salvation by human works does not result. But then it is difficult to see either how man is genuinely free with regard to such works or how the merit wrought by such works can be attributed to man rather than to God. The conclusion follows, then, that the Molinist who wishes to remain a Molinist ought to reject the Catholic doctrine of justification in favor of a Protestant understanding of salvation as a wholly unmerited and freely accorded gift of God's grace.

In any case, the doctrine of middle knowledge as such does not entail a violation of the universal causality of God. One could theoretically maintain that God does cause everything that happens and yet that prior to His decree He knew what creatures would freely do were He to let them.[52] One could go so far as to say that God, knowing via middle knowledge the mess that free creatures would make of any world, decided that such a world was finally not worth it and so created instead a world in which He Himself causally determines everything which occurs. Some opponents of middle knowledge incorrectly charge that free creatures cause God's middle knowledge of various actualizable worlds. But such an allegation is obviously mistaken, since in that logically prior moment nothing but God exists, so that there can be no talk of a *causal* relation. Rather Molinists have consistently asserted that there is no cause of God's cognitions *extra se*, but that He knows counterfactuals of freedom through His own essence, that is to say, innately.

That leads to the second half of Garrigou-Lagrange's objection, that middle knowledge posits passivity in God. Despite Molinist protests, I think we shall have to admit that this is true.[53] But at the same time, as I said above, this seems to me of no great consequence. As I argued earlier, God's simple foreknowledge can be understood as determined in its content by what will in fact occur. This sort of determinacy or passivity on God's part seems to me altogether innocuous, and if this sacrifices the Thomistic view of God as Pure Actuality, then so be it. The Thomistic view, that God determines not only the truth of future contingent propositions, but also the truth of counterfactuals of freedom, seems to lead inescapably to

making God the author of sin and to a denial of human freedom and responsibility in general.[54]

But does this not seriously compromise God's omnipotence, as Garrigou-Lagrange claims? Middle knowledge certainly does affect the concept of divine omnipotence, but as Thomas Flint with the collaboration of Alfred Freddoso has shown in their brilliant analysis of this divine attribute, middle knowledge does not posit any abridgement of divine power which does not arise from purely logical considerations, so that such an abridgement is not only unobjectionable, but necessary.[55] Proposing to analyze God's omnipotence in terms of His ability to actualize states of affairs, they ask us to consider the case of Jones, who in circumstances $C$ is free with regard to writing a letter to his wife. At the moment $t$ Jones has the power to actualize the state of affairs

> 20. Jones's freely deciding in $C$ at $t$ to write a letter to his wife

or the state of affairs

> 21. Jones's freely deciding in $C$ at $t$ to refrain from writing a letter to his wife.

But since Jones is free, no one distinct from Jones, not even God, can have at $t$ both the power to actualize (20) and the power to actualize (21). For according to the doctrine of middle knowledge, it is true either that

> 23. If Jones were in $C$ at $t$, he would freely decide at $t$ to write to his wife

or that

> 24. If Jones were in $C$ at $t$, he would freely decide at $t$ to refrain from writing to his wife.

Only Jones himself has the power to determine whether (23) or (24) is true, since the decision is free. Not even the omnipotent God can simply decree which of these two counterfactuals is true. As a result, God does not have the power to actualize every possible state of affairs. For if (23) is true, then it is not within God's power to actualize (21). God could actualize $C$, but so long as He allows Jones to act freely, He cannot actualize (21) because Jones will then decide to write to his wife, as (23) tells us. On the other hand, if (24) is true, then it is not within God's power to actualize (20), for were He to actualize $C$ and leave Jones free, Jones would decide not to write his wife. Thus, whether (23) or (24) is true, conclude Flint and Freddoso, ". . . there will be some state of affairs . . . which even an omnipotent agent is incapable of actualizing. And since this inability results solely from the *logically necessary* truth that one being cannot

causally determine how another will freely act, it should not be viewed
. . . as a kind of inability which disqualifies an agent from ranking
as omnipotent."[56]

The doctrine of middle knowledge therefore entails that it is not
within God's power to actualize just any world He pleases. His mid-
dle knowledge of true counterfactuals of freedom serves to delimit for
Him from the range of all possible worlds a proper subset of worlds
which are *feasible* or *realizable* for God. It is this restriction that lies
at the heart of the Free Will Defense, which asserts that it is possible
that a sinless world of free creatures, while logically possible, is not
realizable because creatures would go wrong if left free in the relevant
circumstances. But such a restriction should not be regarded as im-
pugning God's omnipotence, since it is a matter of logical necessity
that God cannot actualize worlds corresponding to a false counterfac-
tual of creaturely freedom. A final interesting implication of Molinist
doctrine is that omnipotence must be relativized to a world, that is
to say, God is able to actualize some states of affairs in one world
but not in another. For counterfactuals of freedom are not true in
all worlds or they would be freedom-negating entailments. For exam-
ple, while (23) is true, in other worlds (24) is true. Hence, in those
other worlds God is unable to actualize a world in which (23) is true,
though such a feat lies within His power in the actual world. This
interesting consequence of Molinist doctrine does not mean that God
is not essentially omnipotent. Rather just as God is omniscient in all
worlds in which He exists, but the content of what He knows varies,
so God is omnipotent in all worlds in which He exists, but the content
of what He can do varies. The doctrine of divine middle knowledge
therefore constitutes no denial of God's omnipotence, though it does
reveal restrictions on what God can actualize as a consequence of
purely logical considerations.

In summary, I think that with regard to the second traditional
objection to the doctrine of middle knowledge—that such knowledge
posits passivity in God—we can agree that while middle knowledge
does posit passivity in God and restricts the scope of His omnipo-
tence, it does not negate God's universal causality or place any limit
on divine omnipotence which is not required by logic alone. So al-
though the doctrine the middle knowledge does deny certain features
of Thomism, it is not therefore incompatible with the Christian con-
cept of God.

## Middle Knowledge and Divine Freedom

That brings us finally to the third traditional objection: that middle knowledge destroys divine freedom. Molina himself believed that if God had middle knowledge of counterfactuals of divine freedom as well as middle knowledge of counterfactuals of creaturely freedom, then God's freedom of will would be destroyed, and he sought to escape this consequence by means of his doctrine of supercomprehension. But critics have denounced that doctrine as "gratuitously invented" in order to avoid divine determinism.[57] Thomists have charged that if divine freedom is destroyed by God's knowledge of counterfactuals of divine freedom then equally is creatures' freedom destroyed by God's knowledge of counterfactuals of creaturely freedom.[58] Suarez, on the other hand, while no friendlier to supercomprehension than Thomist critics, argued that just as middle knowledge of creaturely decisions does not annul their freedom so neither does middle knowledge of divine decisions annul the freedom of those decisions. God may know what He would freely do under any circumstances without thereby being determined so to act in those circumstances. Hence, supercomprehension is a superfluous doctrine.

This debate has recently received fresh input through the incisive work of Thomas Flint on the subject of divine freedom.[59] Observing that since there is an infinite number of circumstances, or states of affairs, in which a free creature can find himself, Flint notes that there must be an infinite number of corresponding counterfactuals for any free creature. In deciding which possible world to actualize, God is guided by His knowledge of how the instantiation of any individual creaturely essence would freely act in any state of affairs in which he might find himself. Flint calls a complete set of such counterfactuals a "creaturely world-type." More formally, a creaturely world-type is a set such that for any proposition $p$, (i) $p$ is a member of the set only if $p$ or $\sim p$ is a counterfactual of creaturely freedom and (ii) if $p$ is such a counterfactual, then either $p$ or $\sim p$ is a member of the set. A creaturely world-type is said to be "true" only if all of its constituent propositions are true. Hence, to say that God is guided by His knowledge of counterfactuals of creaturely freedom is to say that He is guided by His knowledge of which creaturely world-type is true.

Flint notes three important points about creaturely world types: (1) Whichever creaturely world-type is true is only contingently true. Since counterfactuals of freedom are true relative to a world, the same is the case for the world-type. Different world-types are true at

different worlds. (2) God cannot make a particular creaturely world-type to be true. As we saw in our discussion of divine omnipotence, which world-type is true limits the range of possible worlds which God can instantiate. This is because which counterfactuals of freedom are true logically precedes the decree of the divine will. Hence, God has no control over which creaturely world-type is true. (3) Every creaturely world-type determines a unique galaxy, or proper subset of all possible worlds, which are realizable for God. Which world-type is true restricts the range of all possible worlds to those worlds which God can actualize. There will be an infinite number of such worlds, which may be called a galaxy of worlds. A world is "feasible" for God iff it is a member of the galaxy of worlds determined by the true creaturely world-type.

Now any free being will in part determine which world-type is true. For some of the true counterfactuals of freedom will concern his own free decisions and, hence, it is up to him whether these counterfactuals are true (and therefore a member of the world-type) or false. But of course the vast majority of propositions in the world-type are counterfactuals concerning the free actions of other beings, and over these he has no control. We can therefore speak of the set of all and only those true counterfactuals of freedom (or true negations of such counterfactuals) over whose truth value any free agent $x$ has no control; this set will be a proper subset of the true world-type, and Flint calls it the "world-type-for-$x$." The world-type-for-$x$ is all the counterfactuals of freedom in the true world-type minus the counterfactuals concerning $x$'s own free choices. Thus, every free being is confronted with a set of counterfactuals over whose truth-values he has no control. It is logically impossible for any free agent $x$ to bring about a state of affairs inconsistent with the world-type-for-$x$ with which he finds himself confronted.

Now the significance of this analysis for divine freedom and middle knowledge becomes clear when we reflect that in addition to counterfactuals of creaturely freedom there are also counterfactuals of divine freedom, and the true world-type must include both of these. For any free creature $x$, the world-type-for-$x$ includes counterfactuals of both divine and creaturely freedom. In God's case, however, the world-type-for-God is comprised solely of counterfactuals of creaturely freedom, since God has control over the truth values of counterfactuals of divine freedom. Now in the moment logically prior to the divine decree, God possesses middle knowledge of all true counterfactuals of creaturely freedom and, hence, of the world-type-for-God. It is therefore logically impossible for Him to actualize any state of affairs

inconsistent with the world-type- for-God, such states of affairs not being feasible for or realizable by God, and we have seen how this restriction has been exploited by Plantinga in his Free Will Defense and by Flint and Freddoso in their analysis of omnipotence.

The question is, does God also possess in that logically prior moment middle knowledge of counterfactuals of divine freedom? A moment's reflection reveals that He cannot. For what God knows via His natural and middle knowledge is logically prior to the free decree of the divine will and thus outside of God's control. But counterfactuals of divine freedom are within God's control, since they are not members of the world-type-for-God. Therefore, counterfactuals of divine freedom cannot be true or known prior to the decree of the divine will. God's knowledge of what He would do under any circumstances is determined by the decree of His will and is thus part of His free knowledge. God's middle knowledge is identical with His knowledge of all true counterfactuals of creaturely freedom, or the true world-type-for-God.

This interesting and perhaps unexpected consequence thus vindicates Molina over against Suarez in the former's denial of middle knowledge of counterfactuals of divine freedom. While God's middle knowledge of creatures' free decisions does not remove their freedom, middle knowledge of God's free decisions is incompatible with divine freedom. Molina was thus justified in his desire to formulate a doctrine of supercomprehension that would yield middle knowledge of counterfactuals of creaturely freedom without resulting in middle knowledge of counterfactuals of divine freedom. Unfortunately, his attempt to draw a distinction between comprehension and supercomprehension seems singularly unconvincing. He should rather have simply affirmed that prior to the divine decree counterfactual states of affairs concerning divine decisions do not yet obtain, since they are logically posterior to the divine decree. The upshot of this discussion for the basis of middle knowledge would seem to be that comprehension of a creaturely essence is not, after all, sufficient to discern the free choices of its instance (unless, with Kvanvig, we make counterfactuals part of creaturely essences, but then exempt them from the divine essence), for God comprehends His own nature via natural knowledge and yet lacks middle knowledge of how He would act in any circumstances. His middle knowledge should therefore be construed as possible due to His immediate knowledge of all true propositions at that logically prior moment, as Suarez maintained.

In summary, then, we have seen in response to the third objection— that middle knowledge is incompatible with divine freedom—that the

true world-type includes counterfactuals of both divine and creaturely freedom, the latter alone being true logically prior to the divine decree and constitutive of a world-type-for-God over whose truth value He has no control. His middle knowledge is identical with His knowledge of the world-type-for-God and guides Him in deciding how He would act in any circumstances and which world He will instantiate. The basis of divine middle knowledge may be held to be His innate knowledge of all propositions true at that logical moment.

## Conclusion

In conclusion, it seems that divine middle knowledge is certainly possible. Opponents of middle knowledge have not shown that, contrary to ordinary usage, counterfactuals of freedom cannot be true or that they cannot be true logically prior to God's decision to actualize a world or that God cannot know them at such a moment. Middle knowledge does posit passivity in God, but does not impugn His omnipotence because such restrictions as it does pose are purely logical in nature. Finally, middle knowledge is compatible with divine freedom, since it is restricted to counterfactuals of creaturely freedom. So it would seem that middle knowledge is possible, and this is all that needs to be proved in order to show that God's knowledge of future contingent propositions is not impossible. The doctrine of divine middle knowledge also affords room for a sort of deliberation on God's part logically prior to His decision to actualize a world. On the other hand, it must be admitted that in terms of explaining prescience, middle knowledge does not make much explanatory advance beyond an innatist view of foreknowledge, since middle knowledge finally appeals to innatism as well. The real value of the doctrine of middle knowledge comes in the striking account it gives of providence and the reconciliation it effects between divine sovereignty and human freedom. So long as middle knowledge is possible, God's sovereignty and man's freedom are logically consistent. Indeed, the account which middle knowledge affords of God's providence is so compelling and intellectually satisfying, as well as biblically unobjectionable, that I am inclined to regard the doctrine as true.[60]
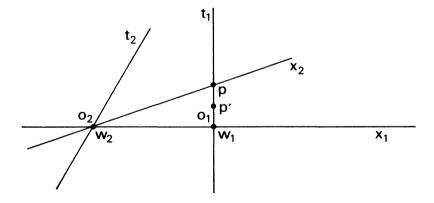
## IS THE SPECIAL THEORY OF RELATIVITY FATALISTIC?

A fascinating and instructive parallel to the debate over theological fatalism exists in the philosophy of space and time in discussions concerning the Special Theory of Relativity. Certain thinkers have argued that the Special Theory implies a view of spacetime which has, in turn, fatalistic implications.

For example, Hilary Putnam in an address to the American Physical Society on January 27, 1966, argues that the Special Theory of Relativity implies that events future to us are real, that is to say, actual and existent.[1] Putnam's argument is based on the assumption that "There are no privileged observers" and the principle

> 1. If it is the case that all and only the things that stand in a certain relation R to me-now are real, and you-now are also real, then it is also the case that all and only the things that stand in the relation R to you-now are real.

Drawing a clever analogy to Aristotle's sea fight tomorrow, Putnam considers the case of a space fight tomorrow. He points out that, according to the Special Theory, a space battle which lies in my future may exist in the present or past of some other observer in an inertial frame which is in motion relative to my own. Consider the following spacetime diagram:[2]



$W^1$ is an observer located at $O^1$ in the inertial frame having the time axis $t^1$ and the three-dimensional space axis $x^1$. $W^2$ is another observer at $O^2$ in an inertial frame having the axes $t^2$, $x^2$ which is in

relative motion to the first. For $W^1$, observer $W^2$ at $O^2$ exists in the present, that is to say, exists now and is simultaneous with himself at $O^1$. But for $W^2$, it is event $P$ (a battle in space) which is now and is simultaneous with himself at $O^2$. Even though $P$ lies in $W^1$'s absolute future, this event is wholly real and actual for $W^2$. In fact if we consider some slightly earlier event $P'$(preparations for the battle), this event is actually past for $W^2$ even though it is absolutely future for $W^1$. Putnam concludes that since $P$ is real for $W^2$ and $W^2$ is real for $W^1$, $P$ must also be real for $W^1$. Interpreting this result in the context of Aristotle's denial of the Principle of Bivalence for future contingent propositions, Putnam concludes,

> Aristotle was wrong. At least he was wrong if Relativity is right; and there is today better reason to believe Relativity than to believe Aristotle, on this point at least. To see this, . . . let there be a space-fight which is 'in the future' in my coordinate system . . . . but in the past in your coordinate system, . . . Then, since the space-fight is 'in the future' (for me), I must say that the statement 'the A's will win or have already won' has no truth value. But if you say that this statement *has* a truth value —as you must, if Aristotle is right, since it lies 'in the past' for you— then you and I cannot both be right, without becoming a Privileged Observer![3]

Since $W^1$ and $W^2$ are arbitrarily chosen observers, neither of which is privileged, one can designate for any event in spacetime a pair of hypothetical, spatially separated observers for whom that event lies in the past of one observer and in the future of the other. All events are therefore on an ontological par, equally real and existent. In short, the Special Theory proves that the B-theory of time is correct and the A-theory false.[4]

Taking a line similar to Putnam's, D. H. Mellor[5] considers and rejects three possible escape routes for the A-theorist (whom he, following J. J. C. Smart, calls "Augustinian"): (i) Take as present all events not absolutely past or absolutely future. According to this view, all events having a space-like separation from $W^1$, that is, lying outside the forward or backward light cone of $W^1$, are present for $W^1$. The trouble with this understanding, retorts Mellor, is that co-existence is then not transitive. Though $P$ is present for $W^2$ and $W^2$ is present for $W^1$, $P$ is not present for $W^1$. What is present is purely relative. (ii) Take as present only events that are present in every acceptable frame of reference. On this view, only events are present which every observer at some point in space agrees are present. But then the present becomes shrunk down to what is here at this point-instant. (iii) Choose arbitrarily one frame of reference to define simultaneity and, hence, present existence and truth at any time. In other words,

deny that there are no privileged observers, but single out one reference frame as privileged and, hence, definitive for the "now." But Mellor objects that such a move is *ad hoc*, picking out a present merely to preserve the Augustinian account of existence and truth. Special Relativity allows no more than a conventional distinction between one such present and any other; but the distinction between what exists and what does not is surely more than conventional.

Mellor concludes, "For Augustinians, therefore, it becomes conventional what exists at any time, and hence, for tense-logic, it becomes conventional what is presently true."[6] Apparently losing self-restraint in the heady atmosphere of a scientific convention, an ebullient Putnam declares,

> I conclude that the problem of the reality and the determinateness of future events is now solved. Moreover, it is solved by physics and not by philosophy. We have learned that we live in a four-dimensional and not a three-dimensional world, and that space and time . . . are just two aspects of a single four-dimensional continuum . . . . Indeed, I do not believe that there are any longer any philosophical problems about Time; there is only the physical problem of determining the exact physical geometry of the four-dimensional continuum that we inhabit.[7]

According to these thinkers, then, the four-dimensional spacetime implied by the Special Theory has removed any basis for distinguishing objectively between past, present, and future, for these are merely observer-dependent notions and all events in the spacetime manifold are equally existent and actual.

But such a conception of reality has been regarded by adherent and opponent alike as fatalistic.[8] In a particularly bold expression of this sentiment, Rietdijk claims that the Special Theory furnishes a "rigorous proof" of fatalism.[9] He states,

> We can say that an event $P$ is (pre-) determined if for any possible observer $W^1$ . . . , who has $P$ in his absolute future . . . , we can think of a possible observer $W^2$ . . . who can prove, at a certain moment $T^v$, that $W^1$ could not possibly have influenced event $P$ in an arbitrary way (e.g., have prevented $P$) at any moment when $P$ was still future, or was present, for $W^1$, supposed that $W^1$ did desire to do so.[10]

Referring to the above spacetime diagram, we can see that $W^2$ by eventually receiving light rays from $P$ could prove that $P$ existed at a time which was still future for $W^1$. Indeed, $W^2$ could have photographs of $P$ which he could show to $W^1$ when $t^2$ and $t^1$ intersect. $W^1$ will realize that the light rays from $P$ which $W^2$ received must have been emitted at a time when $P$ was still a future contingent for $W^1$. Since $P$ was present for $W^2$ while it was still future for $W^1$, $W^2$ knows that "$W^1$ *could do nothing at all to prevent event $P$* in his absolute future."[11] The Special Theory of Relativity therefore implies

fatalism and, therefore, according to Rietdijk, spells the "definite end of indeterminism" and free will.[12]

But like all fatalistic arguments, Rietdijk's reasoning is fallacious. For as John Sinks points out, from $W^2$'s observation of $P$ as present (or past) for him but absolutely future for $W^1$, all that follows is that $W^1$ *will not prevent* $P$, not that he cannot prevent $P$.[13] Sinks notes that it is both logically and causally possible for $W^1$ to prevent $P$; the only sense in which he "cannot" is "does not": "The thesis boils down to the claim that an agent will not do what he will not have done."[14] Of course, if $W^1$ were to prevent $P$, we should add, then $W^2$ would not have observed $P$ in his present or past. From the fact that $P$ is observed as present or past, $W^2$ can be absolutely certain that $W^1$ will not prevent $P$; but what he may not validly infer is that $P$ is fated for $W^1$ or that $W^1$ cannot prevent $P$. Hence, Rietdijk's "rigorous proof" only repeats in a contemporary field of science an ancient modal fallacy characteristic of fatalistic reasoning.

Now this example of fatalistic motifs in relativity discussions is quite instructive for the debate concerning theological fatalism. For the analogy between the two is obvious. $W^2$'s observation of $P$ in $W^1$'s absolute future is analogous to God's foreknowledge of some future contingent. The claim that $W^1$ cannot prevent $P$ is analogous to the claim that Jones cannot refrain from doing what God foreknows he shall do. The counterfactual solution to the problem is the same: if $W^1$ or Jones were to prevent some event which is in fact future, then $W^2$'s observation or God's foreknowledge would have been different. What is especially stunning in the case of special relativity is that not merely $W^2$'s observation, but even $P$ itself is as existent and fully actual as any past or present event and should therefore, if the fatalist is correct, be characterized by the same temporal necessity that attaches to God's past belief. For on a B-theory of time all events are equally real and instantiated, and relations of past, present, and future are relative to reference frames. $W^1$ therefore has it within his power to prevent a fully actual, instantiated, real and existent event which lies in his future, as well as the power to act such that $W^2$ would not have had the photographs of $P$ which he in fact has and would not have observed $P$ to be present (or past) as he in fact did. The Special Theory would therefore appear to provide a nearly crushing counter-example to the fallacious reasoning that undergirds theological fatalism.

Unfortunately, this counter-example is not decisive, for one could avoid the fatalistic implications of the Special Theory by denying, not that the B-theory is fatalistic, but that the Special Theory implies a

B-theory. Perhaps the most plausible way of doing this would be to distinguish between metaphysical (or ontological) time and physical (or measured) time.[15] In fact, once one understands the radical positivism of Machian provenance that underlay Einstein's operational re-definition of simultaneity in his 1905 paper on relativity, one is surprised, in light of the subsequent demise and nearly universal rejection of positivism and its attendant verificationist theory of meaning, that this is not more often done.[16] One could maintain that metaphysical time is A-series time and leave open the question of whether or not the time of physics is a B-theoretic continuum.

But even if one is willing to acquiesce to Einstein's re-definitions and identification of ontological with measured time, he still is not compelled to adopt a B-theory, for at least two further options remain open to the A-theorist: (i) the A-theorist may interpret temporal becoming as relative to reference frames.[17] According to this solution, just as properties of length, duration, and simultaneity have no absolute, non-relativistic significance, so existence or coming-to-be must be relativistically construed. An event $P$ or entity $x$ in relativistic spacetime does not occur or exist absolutely, but only in relation to local reference frames. Thus, $P$ may be present and existent for $W^2$, but non-existent and potential for $W^1$. The relation "is real for" would, *contra* Putnam, not be transitive. $P$ may be real for $W^2$ and $W^2$ real for $W^1$, but $P$ not real for $W^1$. Therefore, temporal necessity would also be relative to reference frames: $P$ may be temporally necessary (because past) in one inertial frame and temporally contingent (because non-existent and future) in another inertial frame. An even more radical version of this solution would be to deny reality not only to all events absolutely future for an observer at some spacetime point, but also to all events having a space-like separation from that observer and to restrict reality to events in or on his past light cone.

Alternative (i) involves a conception of reality which we may find difficult to swallow (I must confess that I do!).[18] But alternative (ii) is intuitively more plausible: the A-theorist may posit a preferential reference frame yielding a cosmic time with absolute simultaneity and a world-wide edge of becoming.[19] In our discussion of tachyons, we saw that by positing such a privileged frame one construes relativity as a local phenomenon. In the privileged frame, universal three-dimensional cross-sections of spacetime may be determined, and these are sufficient for the existence of absolute simultaneity in the world. The A-theorist may regard moments or slices of spacetime which are future for this preferential reference frame as simply unreal, and therefore the present in this cosmic time represents the universal moment

of becoming. Events that are future according to cosmic time cannot be experienced as real in any local frame.

That such a cosmic time exists is evident from the expansion of the universe and is acknowledged by relativity theorists. We must not forget that Einstein proposed his Special Theory long before the cosmic expansion was discovered, so that in the absence of the characterless and moribund aether there seemed to be no empirical basis for positing any universal frame beyond the multitude of locally moving frames. But with the discovery that the universe is expanding, it became possible to envisage a universal reference frame by imagining observers to be associated with fundamental particles which are at rest relative to the expansion of space itself. Already in 1920 Eddington recognized that the General Theory of Relativity posited a sort of cosmic time, but he objected that such a cosmic time was unknowable and, hence, irrelevant for observers in locally moving frames.[20] Within a few years, however, the expansion of the universe predicted by Einstein's field equations (minus the cosmological constant) had been confirmed by observational astronomy, thus providing a sort of cosmic clock which the abandonment of the aether theory seemed to have rendered otiose. Of course, it might still be objected that this universal time is unknowable and, hence, irrelevant. But not only does this objection seems to be infected with a defunct verificationist attitude, but it does not even appear to be true. P. C. W. Davies explains,

> At any given place in the universe, there is only one reference frame in which the universe expands isotropically. This privileged reference frame defines a privileged time scale (the time as told by a clock at rest in that frame). Two separated places have their privileged reference frames in mutual motion, because of the expansion of the universe. Nevertheless, the time measured by the entire collection of imaginary standard clocks are obviously correlated such that the global condition (e.g., average separation of two galaxies) of the universe appears the *same* at equal times as registered by every privileged clock (assuming they are all properly synchronized). Happily, the earth is moving very slowly relatively to the local privileged frame in our vicinity of the universe, so that Earth time is a fairly accurate measure of cosmic time.[21]

Not only, then, does a cosmic time exist, but we even have a pretty fair idea of what time it is.

This fact is, as I say, recognized by relativity theorists today, but many would presumably object to regarding this universal frame with its cosmic time as in any way privileged. It is but one of an infinite number of ways of slicing spacetime into three dimensional hypersurfaces and enjoys no preferential status over them. To single out this frame as preferred is, as Mellor charged, arbitrary and *ad hoc*.

But for my part, I must confess that this objection strikes me as very puzzling. The universal time of classical physics was thought to be undercut by the Special Theory precisely because, in abandoning the aether reference frame, relativity theory seemed to have removed any empirical grounds for such a universal frame and universal time. But now that such a frame and time, determined by the isotropic expansion of the universe, have been empirically demonstrated, is it not clear that they have regained the throne from which they had been temporarily toppled by special relativity? Even without this historical precedent, is it not naturally clear that the time which measures the universe along hyper-surfaces of homogeneity enjoys a privileged status over all the times associated with arbitrary slicings of space-time, which destroy its homogeneity and isotropic expansion? Nor is such a claim to supremacy *ad hoc*, for this universal frame is not posited merely "to preserve the Augustinian account of existence and truth," but is forced upon us by modern science itself. Moreover, if the A-theorist is correct that his theory captures more adequately the nature of time and becoming than the B-theory, then he is certainly within his rights to regard this cosmic frame as preferred on metaphysical grounds.

The mention of metaphysics raises one final point: the theist who regards God as temporal is within his rights to regard God as an observer in a universal reference frame having a cosmic time and a universal "now" which is privileged in virtue of its being the reference frame of the Creator Himself. Eddington remarked, "Just as each limited observer has his own particular separation of time and space, so a being coextensive with the world might well have a special separation of space and time natural to him. It is the time for this being that is here dignified by the title 'absolute'."[22] Fitzgerald makes the obvious connection with theism when he identifies this being as God and suggests that the theologian might hold that God's "now" defines the worldwide tide of Absolute Becoming.[23] The theist is by no means obligated to embrace views of time and space inspired by non-theistic viewpoints, and the A-theorist who is a theist may hold his view of absolute becoming and the unreality of the future as well as the Special Theory of Relativity without embarrassment or apology.

So the lesson of the Special Theory of Relativity for theological fatalism is not one that the fatalist can be forced to learn. He could maintain that a B-theory of time is, indeed, fatalistic, but deny that the Special Theory implies a B-theory of time. Nevertheless, I think the illustration from relativity still possesses considerable force, for

not only do we see once more the fallacious reasoning of fatalism exposed, but we also find proponents of the B-theory, whose numbers are considerable, in the company of the defenders of the compatibility of divine foreknowledge and human freedom. If B-theorists are correct in rebutting the charge of fatalism against their theory, then the victory of the opponent of theological fatalism is likewise ensured.

## NOTES TO PREFACE

1. Anthony Kenny, *The God of the Philosophers* (Oxford: Clarendon Press, 1979), p. 129.
2. Richard Swinburne, *The Coherence of Theism* (Oxford: Clarendon Press, 1977).
3. Ronald Nash, *The Concept of God* (Grand Rapids, Mich.: Zondervan, 1983).
4. Stephen T. Davis, *Logic and the Nature of God* (Grand Rapids, Mich.: Wm. B. Eerdmans, 1983). I have not had the chance to avail myself of Edward R. Wierenga, *The Nature of God*, Cornell Studies in the Philosophy of Religion (Ithaca, N.Y.: Cornell University Press, 1989), which appeared as we were going to press.
5. John Moskop, *Divine Omniscience and Human Freedom* (Macon, Ga.: Mercer University Press, 1984).
6. Jonathan L. Kvanvig, *The Possibility of an All-Knowing God* (New York: St. Martin's Press, 1986).
7. William Lane Craig, *The Problem of Divine Foreknowledge and Future Contingents from Aristotle to Suarez*, Studies in Intellectual History 7 (Leiden: E.J. Brill, 1988).

## NOTES TO INTRODUCTION

1. Sylvestre Bergier, *Le Déisme réfuté par lui-même, ou examen, en forme des lettres, des principes d'incrédulité répandus dans les divers ouvrages de J.-J. Rousseau*, new ed. (Besançon: Imprimerie de Outhenin-Chaleandre Fils, 1842), pp. 4-5.
2. Ibid., p. 8.
3. Ibid., p. 12.
4. Ibid., p. 30.
5. Alvin Plantinga, "The Foundations of Theism: A Reply," *Faith and Philosophy* 3 (1986): 310; cf. Philip Quinn, "In Search of the Foundations of Theism," *Faith and Philosophy* 2 (1985): 468-86.
6. W. V. Quine and J. S. Ullian, *The Web of Belief*, 2d ed. (New York: Random House, 1978), p. 131.
7. Anthony Kenny, *The God of the Philosophers* (Oxford: Clarendon, 1979), p. 10.
8. Stephen T. Davis, *Logic and the Nature of God* (Grand Rapids, Mich.: Wm. B. Eerdmans, 1983), pp. 25-37.
9. David Lewis, "Attitudes *De Dicto* and *De Se*," *Philosophical Review* 88 (1979): 513-43.
10. Jonathan L. Kvanvig, *The Possibility of an All-Knowing God* (New York: St. Martin's Press, 1986), pp. 66-71, 156-59. Kvanvig objects to Lewis's account because it cannot, he charges, distinguish between an impossible state of affairs and a state of affairs which could never be truly believed to obtain. For example, when I entertain the thought that I do not exist, I must be ascribing to myself a property which implies my own non-existence. Such a property is impossible, for nothing could possibly exemplify it. But a state of affairs including my non- existence is clearly not impossible; I just cannot personally truly believe it to obtain. Thus, the self-ascription of properties view inevitably confuses some possible states of affairs with impossible ones (Ibid., p. 59).

Lewis, however, in personal correspondence replies that in entertaining my own non-existence, I am not self-ascribing Kvanvig's admittedly impossible property, but rather the property of living in a possible world in which the proposition "William Craig does not exist" is true. This property is clearly possible, as is the state of affairs described in the proposition, but I can never truly believe myself to have such a property. Therefore, no confusion between possible and impossible states of affairs results.

Kvanvig's own view seems superior to a similar position expressed by Edward Wierenga, "Omniscience and Knowledge *De Se et De Praesenti*," in *Philosophical Analysis*, ed. David F. Austin, Philosophical Studies Series 39 (Dordrecht: Kluwer Academic Publishers, 1988), pp. 251-58. For Wieringa regards (12) and (13) as expressing *different* propositions, and yet he maintains that God can access (13) in such a way that He does not have *de se* knowledge. But if the proposition itself is a first-person proposition, then if God knows that very proposition, it seems inexplicable why He would not have knowledge *de se*; for otherwise, He does not grasp its full propositional content.

The Lewis-Kvanvig proposals serve to remove the teeth from the objection of Patrick Grim, "Against Omniscience: The Case from Essential Indexicals," *Noûs* 19 (1985):151-80, who misconstrues omniscience to mean that God must possess all *de dicto* and *de se* knowledge.

11. Charles Taliaferro, "Divine Cognitive Power," *International Journal for Philosophy of Religion* 18 (1985): 133-40.

12. William Alston, "Does God Have Beliefs?", *Religious Studies* 22 (1986): 287-306. One advantage of Alston's model is that it would seem to undercut the theistic version of the Knower Paradox presented by Patrick Grim, "Truth, Omniscience, and the Knower," *Philosophical Studies* 54 (1988):9-41. Grim argues that the seemingly innocuous triad (i) If something is known by God, it is so; (ii) God knows (i); and (iii) If $B$ is derivable from $A$, and God knows $A$, then God knows $B$, is demonstrably inconsistent. Yet genuine omniscience demands that all three be true. Grim argues that attempts to escape this paradox by hierarchies of truth fail because in the final analysis they prohibit any global notion of truth (*e.g.*, Every proposition is either true or false) or of knowledge (*e.g.*, God knows all truths). But on Alston's model God's knowledge is not propositional and, hence, not infinitely fragmented; He knows all truth without knowing all truths. We fragment God's intuition of truth into propositions, so that if there is a paradox it exists only for us propositional knowers. In fact, if the number of propositions is potentially infinite (generated by finite knowers' conceiving of them), then the hierarchy is finite and non-paradoxical. This serves to highlight another advantage of Alston's model: it relieves us of the burden of maintaining that God has an actually infinite number of ideas or knows an actually infinite number of facts. (See Patrick Grim, "There Is No Set of All Truths," *Analysis* 44 [1984]:206-08.) Arguments appealing to God's omniscience to prove that an actual infinite exists, such as those of William Lawhead, "The Symmetry of the Past and Future in the *Kalam* Cosmological Argument" and Robert Prevost, "Classical Theism and the *Kalam* Principle," in *Rational Theism*, ed. Wm. L. Craig and M. McLeod [Lewiston, N.Y.: Edwin Mellen, 1990], are therefore unavailing.

13. See Kvanvig, *All-Knowing God*, pp. 38-46.

14. For a brief discussion see my *The Only Wise God* (Grand Rapids, Mich.: Baker, 1987), pp. 21-48.

15. H. Van Dyke Parunak, "A Semantic Survey of *NHM*," *Biblica* 56 (1975): 512-32; see also Terence E. Fretheim, "The Repentance of God": *Horizons in Biblical Theology* (forthcoming).

## NOTES TO CHAPTER ONE

1. A. N. Prior, "Changes in Events and Changes in Things," in *Papers on Time and Tense* (Oxford: Clarendon Press, 1968), p. 6.
2. A. N. Prior, "The Formalities of Omniscience," in *Time and Tense*, pp. 29-32.
3. A. N. Prior, *Formal Logic* (Oxford: Clarendon Press, 1955), p. 241. Similarly, Prior objected to timeless propositions about genuinely undetermined events: "For what is the case already has passed out of the realm of alternative possibilities into the realm of what cannot be altered" (A. N. Prior, "Three-Valued Logic and Future Contingents," *Philosophical Quarterly* 3 [1953]: 323).
4. A. N. Prior, "Time and Determinism," in *Past, Present and Future* (Oxford: Clarendon Press, 1967), pp. 115-16.
5. Prior, "Omniscience," p. 37. Prior is indebted at this point to Jonathan Edwards (Prior, "Time and Determinism," pp. 113-15).
6. In the Polish notation used by Prior $C$ is the sign of material implication; I have written out the propositions to aid the student unfamiliar with Prior's marriage of tense logic and Polish notation.
7. Prior, "Time and Determinism," pp. 119-20.
8. Prior, "Omniscience," p. 43.
9. Ibid., pp. 34-6; idem, "Time and Determinism," pp. 121-7.
10. Prior, "Omniscience," pp. 35-6.
11. Ibid., p. 39.
12. Prior, "Three-Valued Logic," pp. 323-6; cf. idem, *Formal Logic*, pp. 244-50. Excluded Middle does, however, hold for modal propositions, so that any proposition is or is not necessary.
13. In his "Three-Valued Logic" Prior implies that future contingent propositions have a truth value, *viz.*, $\frac{1}{2}$; but in "Omniscience" he seems to suggest that such propositions represent truth value gaps. In the former case God would know the truth value of such propositions, while in the latter case He would not.
14. John Lachs, "Professor Prior on Omniscience," *Philosophy* 38 (1963): 365-6.
15. A. N. Prior, "Rejoinder to Professor Lachs on Omniscience," *Philosophy* 38 (1963): 365-6.
16. Prior, "Time and Determinism," p. 129.
17. The contradictory of this statement, *viz.*, "It is the case that it will be the case that $p$" reduces on Prior's view to "It will be the case that $p$", since "It is the case" is vacuous (A. N. Prior, "On Spurious Egocentricity," in *Time and Tense*, p. 22). So the contradictory of this, *viz.*, "It will not be the case that $p$", may mean either "It is not the case that it will be the case that $p$", which is true, or "It will be the case that $\sim p$", which is false. Thus, Prior's fundamental distinction between (23) and (24) is rooted in the ambiguity of "It will not be the case that $p$".
18. Nelson Pike, "Divine Omniscience and Voluntary Action," *Philosophical Review* 74 (1965): 27.
19. Ibid., p. 33.
20. John Locke, *An Essay concerning Human Understanding*, ed. with an Intro. by P. H. Nidditch (Oxford: Clarendon Press, 1975), 2.21.10, p. 238.
21. Nelson Pike, "Of God and Freedom: a Rejoinder," *Philosophical Review* 75 (1966): 374-5.
22. Nelson Pike, *God and Timelessness*, Studies in Ethics and the Philosophy of Religion (London: Routledge & Kegan Paul, 1970), p. 84.
23. Nelson Pike, "Divine Foreknowledge, Human Freedom and Possible Worlds," *Philosophical Review* 86 (1977): 215.
24. Pike, *God and Timelessness*, p. 58.
25. Ibid., pp. 59-60. In his earlier version Pike considered only two alternatives under (36): (i) Jones had the power to do something that would have brought

it about that God believed otherwise than He did 80 years ago; (ii) Jones had the power to do something that would have brought it about that God did not exist 80 years ago. Neither alternative is acceptable, states Pike. For it is an *a priori* truth that "No action performed at a given time can alter the fact that a given person held a certain belief at a time prior to the time in question." And it is an *a priori* truth that "No action performed at a given time can alter the fact that a certain person existed at a time prior to the time in question" (Pike, "Divine Omniscience," pp. 32-3). In response to criticism, he qualifies his position, suggesting that a person may have it in his power "so to act that a belief held at an earlier time was not held at that earlier time" and that the person who held the belief is not "the same person" (Pike, "God and Freedom," p. 377). But then, he insists, we should drop the terms "belief" and "person," for these words are no longer then being used in their ordinary sense. See also Nelson Pike, "Fischer on Freedom and Foreknowledge," *Philosophical Review* 93 (1984): 612-14.

26. G. W. Leibniz, *Theodicy: Essays on the Goodness of God, the Freedom of Man and the Origin of Evil*, trans. E. M. Huggard (New Haven, Conn.: Yale University Press, 1952), p. 144.
27. Pike, "God and Freedom," pp. 374-5.
28. Pike, "Divine Omniscience," p. 36.
29. Pike, *God and Timelessness*, p. 71.
30. Ibid.
31. Ibid.
32. On the other hand, Pike confuses the issue by granting that if Jones does $A$ at $t_2$ then "It is true at $t_1$ that Jones does $A$ at $t_2$" is true. But, he says, this proposition is trivially true and of no real interest. It is difficult to avoid the impression that Pike has here committed himself to the omnitemporal truth of the propositions at issue, in which case we are back to the argument for logical fatalism.
33. Pike, "Divine Omniscience," pp. 44-5.
34. Pike, *God and Timelessness*, p. 79; see also Pike, "Fischer on Foreknowledge," pp. 603, 609-10.
35. See Paul Helm, "Divine Foreknowledge and Facts," *Canadian Journal of Philosophy* 4 (1974): idem, "Fatalism Once More," *Philosophical Quarterly* 25 (1975); idem, "On Theological Fatalism Again," *Philosophical Quarterly* 24 (1974); idem, "God and Whatever Comes to Pass," *Religious Studies* 14 (1978): 315-18; idem, "Timelessness and Foreknowledge," *Mind* 84 (1975).
36. Gary Iseminger, "Foreknowledge and Necessity: *Summa Theologiae* 1a.14, 13 ad 2," *Midwest Studies in Philosophy* 1 (1976).
37. Stephen Richard Boothe, "Temporal Necessity and Divine Foreknowledge," (Ph. D. dissertation, University of California at Irvine, 1978).
38. William Hasker, "Foreknowledge and Necessity," *Faith and Philosophy* 2 (1985): 121-57; idem, "The Hardness of the Past: A Reply to Reichenbach," *Faith and Philosophy* 4 (1987): 337-42; idem, "Hard Facts and Theological Fatalism," *Noûs* 22 (1988):419-36.

## NOTES TO CHAPTER TWO

1. Aristotle *De interpretatione* 9. For a discussion, see my *The Problem of Divine Foreknowledge and Future Contingents from Aristotle to Suarez*, Studies in Intellectual History 7 (Leiden: E. J. Brill, 1988), chap. 1.
2. D. C. Williams, "The Sea Fight Tomorrow," *in Structure, Meaning, and Method*, ed. Paul Henle, Horace M. Kallen, and Susanne K. Langer, with a Foreword by Felix Frankfurter (New York: Liberal Arts Press, 1951), p. 290.

For a discussion, see Leonard Linsky, "Professor Donald Williams on Aristotle," *Philosophical Review* 63 (1954): 251-2; Donald C. Williams, "Professor Linsky on Aristotle," *Philosophical Review* 63 (1954): 253-5.

3. Susan Haack, "On a Theological Argument for Fatalism," *Philosophical Quarterly* 24 (1974): 158. Although her reduction was disputed by Paul Helm, "On Theological Fatalism Again," *Philosophical Quarterly* 24 (1974): 361, his objection was based on an obvious logical mistake, which Haack was quick to point out in Susan Haack, "On 'On Theological Fatalism Again' Again," *Philosophical Quarterly* 25 (1975): 159. In this reply, she unfortunately seems to lose sight of the fact that the temporal necessity of God's foreknowledge can be replaced in the argument by the temporal necessity of the state of affairs of a future-tense proposition's being true. Also missing this point in a further reply is Paul Helm, "Fatalism Once More," *Philosophical Quarterly* 25 (1975): 355-6. For a recent defense of theological fatalism based on purely logico-temporal considerations, see Richard L. Purtill, "Fatalism and the Omnitemporality of Truth," *Faith and Philosophy* 5 (1988): 185-92.

4. Linda Zagzebski, "Divine Foreknowledge and Human Free Will," *Religious Studies* 21 (1985): 283-84.

5. Kvanvig agrees, commenting that the features of Pike's argument which yield his conclusion "include no reference to God's foreknowledge at all. Fatalism is generated on Pike's account in a purely non-theological manner" (Jonathan L. Kvanvig, *The Possibility of an All-Knowing God* [New York: St. Martin's, 1986], p. 92).

6. For a similar reduction of Iseminger's argument, see David M. Rosenthal, "The Necessity of Foreknowledge," *Midwest Studies in Philosophy* 1 (1976): 22-4.

7. Stephen Richard Boothe, "Temporal Necessity and Divine Foreknowledge," (Ph. D. dissertation, University of California at Irvine, 1978), pp. 48-51.

8. Alfred J. Freddoso, "Accidental Necessity and Logical Determinism," *Journal of Philosophy* 80 (1983): 270.

9. Ibid., p. 268.

10. Ibid.

11. Ibid., p. 270. William Hasker's recent attempt to drive a wedge between the temporal contingency of "It was the case that *p*" and "God believed that *p*" (William Hasker, "Hard Facts and Theological Fatalism," *Noûs* 22 [1988]: 419-36) rests on a number of questionable assumptions, *e.g.*, his treating the name *Yahweh* in the proposition "Yahweh believed that *p*" in such a way as to strip it of connotations of omniscience, so that *Yahweh* is, in effect, on a par with *Smith* in this regard. The problem is, when we refer to Yahweh, we *mean* the individual who is God and so is essentially omniscient, so that nothing is achieved by the name substitution in the above proposition. Hasker's refutation of this response is to saddle the non-fatalist with the principle, "If in stating a proposition [*sic*] an individual is referred to by a rigid designator, all essential properties of that individual must be considered in classifying the proposition as a hard or soft fact." But obviously, the non-fatalist is by no means obligated to assume so generous a principle. He need only consider those properties of the individual pertinent to whether his beliefs about future-tense propositions are infallible. If they are, then past-tense propositions concerning his beliefs about future-tense propositions will be as temporally contingent as past-tense statements about the truth status of future-tense propositions.

12. Freddoso, "Accidental Necessity," pp. 271-72.

13. Ibid., p. 278. ". . . every proposition attributing to God a belief about the future is nonimmediate and hence not a member of any submoment. Thus divine foreknowledge would pose no new problems for one who accepts my explication of accidental necessity." See also Thomas Flint and Alfred J. Freddoso,

"Maximal Power," in *The Existence and Nature of God*, ed. Alfred J. Freddoso (Notre Dame: University of Notre Dame Press, 1983), pp. 104-8, where he affirms that propositions like "God believed that Israel will be saved" and "God promised that Jones will be forgiven" are on his theory non-immediate and hence not temporally necessary. Most recently Freddoso is inclined to adopt a Molinist solution to the problem rather than an Ockhamist, contending that temporal necessity is not closed under entailment (Alfred J. Freddoso, "Introduction" to *On Divine Foreknowledge: Part IV of the "Concordia"* by Luis de Molina, trans. with Notes by A.J. Freddoso [Ithaca, N.Y.: Cornell University Press, 1988], pp. 55-62).

## NOTES TO CHAPTER THREE

1. Richard Taylor, "The Problem of Future Contingencies", *Philosophical Review* 66 (1957): 1-28; Roderick M. Chisholm and Richard Taylor, "Making Things to Have Happened," *Analysis* 20 (1959-60): 73-8; Richard Taylor, "I Can," *Philosophical Review* 69 (1960): 78-89; Richard Taylor, "Fatalism," *Philosophical Review* 71 (1962): 56-66.
2. Richard Taylor, *Metaphysics*, Foundations of Philosophy (Englewood Cliffs, N. J.: Prentice-Hall, 1963), p. 57; cf. p. 69.
3. Taylor, "Problem of Future Contingencies," p. 7.
4. Chisholm and Taylor, "Things," pp. 73-74.
5. Richard Taylor, "Causation," *Monist* 47 (1962-63): 303-05.
6. Taylor, *Metaphysics*, p. 64.
7. Taylor, "I Can," p. 78.
8. Ibid., p. 88.
9. Chisholm and Taylor, "Things," p. 78.
10. Taylor, "Future Contingencies," p. 22.
11. Chisholm and Taylor, "Things," p. 78.
12. Richard Taylor, "Fatalism and Ability I," *Analysis* 23 (1962-3): 26; cf. idem, *Metaphysics*, p. 56; idem, "A Note on Fatalism," *Philosophical Review* 72 (1963): 498.
13. Taylor, "Fatalism," p. 63.
14. Taylor, "Fatalism and Ability I," p. 26.
15. Taylor, "Fatalism," pp. 64-5.
16. Steven Cahn, "Fatalistic Arguments," *Journal of Philosophy* 61 (1964): 305.
17. Richard Taylor, "Comment," *Journal of Philosophy* 61 (1964): 307.
18. Taylor, "Fatalism," p. 57; cf. idem, *Metaphysics*, p. 57.
19. Taylor, "Note on Fatalism," p. 497.
20. Taylor, "Future Contingencies," p. 26.
21. Rogers Albritton, "Present Truth and Future Contingency," *Philosophical Review* 66 (1957): 29-46; John Turk Saunders, "A Sea Fight Tomorrow?" *Philosophical Review* 67 (1958): 367-78.
22. See also the defense of Taylor on this point by Steven M. Cahn, *Fate, Logic, and Time* (New Haven, Conn.: Yale University Press, 1967), pp. 34-5.
23. Bruce Aune, "Fatalism and Professor Taylor," *Philosophical Review* 71 (1962): 512-19; Raziel Abelson, "Taylor's Fatal Fallacy," *Philosophical Review* 72 (1963): 93-6; John Turk Saunders, "Professor Taylor on Fatalism," *Analysis* 23 (1962-3): 1-2.
24. Taylor, "Note on Fatalism," p. 497: "The fundamental error of all my critics was their failure to understand this concept;" cf. idem, "Fatalism and Ability I," pp. 25-7.
25. Taylor, "Note on Fatalism," pp. 498-9. See also Cahn's defense of Taylor against these critics in Cahn, "Fatalistic Arguments," pp. 293-5; idem, *Fate,*

pp. 90-8. See further John Turk Saunders, "Fatalism and Linguistic Reform," *Analysis* (1962-63): 30-1, who charges that Taylor's position is merely a linguistic reform concerning how to use "in one's power"; and Peter Makepeace, "Fatalism and Ability II," *Analysis* 23 (1962-3): 27-9, who claims that Taylor's "can" is merely a matter of logic and that just as it is logically impossible to change the past, so it is logically impossible to make something happen in the future if it is not going to happen. Cahn responds that far from engaging in linguistic reform, Taylor utilizes a sense of "can" which is common usage with regard to the past and has merely sought to apply it equably to the future. Moreover, Makepeace's conclusion that one cannot make something happen in the future if it is not going to happen *is* fatalism (Cahn, "Fatalistic Arguments," p. 299)!

26. Richard Sharvy, "Tautology and Fatalism," *Journal of Philosophy* 61 (1964): 293-5; cf. idem, "A Logical Error in Taylor's 'Fatalism'," *Analysis* 23 (1962-3): 96.

27. Taylor, "Comment," p. 306; cf. the critique by J.T. Saunders, "Fatalism and the Logic of 'Ability'," *Analysis* 24 (1963-4): 24.

## NOTES TO CHAPTER FOUR

1. Notable exceptions would be Martin Luther and Jonathan Edwards; contemporary fatalists include Richard Taylor and Paul Helm.

2. See the interesting discussion in Gilbert Ryle, *Fatalism* (Cambridge: Cambridge University Press, 1954), pp. 16-23. He notes that on the fatalist's reasoning, a case can be made that the truth of past-tense propositions necessitates the occurrence of the events which they describe. He then asks, "Why does the fact that a posterior truth about an occurrence requires that occurrence not worry us in the way in which the fact that the anterior truth about an occurrence requires that occurrence does worry us? Why does the slogan 'Whatever is, always was to be' seem to imply that nothing can be helped where the obverse slogan 'Whatever is, will always have been' does not seem to imply this?" (Ibid., p. 23) The answer is that we slide into thinking of anterior truths as *causes* of the occurrences about which they are true. But of course they are not, and it is an unexciting truth, concludes Ryle, that if p is the case, then the corresponding proposition *p* is true at any time.

3. Augustine *De libero arbitrio* 3. 4. 10. 26-32; cf. Nelson Pike, "Divine Omniscience and Voluntary Action," *Philosophical Review* 74 (1965): 27.

4. Paul Helm, "Divine Foreknowledge and Facts," *Canadian Journal of Philosophy* 4 (1974): 313; Paul Helm, "On Theological Fatalism Again," *Philosophical Quarterly* 24 (1974): 361. For a convincing defense of human knowledge of some future contingent propositions, see Jonathan L. Kvanvig, *The Possibility of an All- Knowing God* (New York: St. Martin's, 1986), pp. 13-25.

5. Jan Lukasiewicz, "Philosophical Remarks on Many-valued Systems of Propositional Logic," in *Polish Logic 1920-1939*, with an Introduction by Tadeusz Kotarbiński, ed. Storrs McCall (Oxford: Clarendon Press, 1967), p. 43. According to Lukasiewicz, three classical theorems concerning modal propositions lead to incompatible conclusions. The first theorem, which summarizes a number of principles of scholastic logic, states:

    1. If it is not possible that *p*, then not-*p*.

The second theorem, which is no less intuitive than (1), derives from Aristotle:

    2. If it is supposed that not-*p*, then it is (on this supposition) not possible that *p*.

This theorem expresses, of course, Aristotle's dictum in *De interpretatione* 9.19a23 that whatever is is necessarily when it is. Lukasiewicz grants that

Aristotle's ὅταν is not properly a conditional, but a temporal particle. "Yet the temporal merges into the conditional, if the determination of time in the temporally connected propositions is included in the content of the propositions." He gives the example, "If I now have no money in my pocket, then on this assumption, it is not possible that I now have money in my pocket." The third theorem is based on the Aristotelian conviction that there are some things which *can be*, but *need* not be:

3. For some $p$: it is possible that $p$ and it is possible that not-$p$.

Theorem (1) may be expressed: $CNMpNp$. Theorem (2) cannot in bivalent logic be expressed other than $CNpN̄Mp$. Letting "$\Sigma$" be the existential quantifier, (3) can only be expressed: $\Sigma pKMpMNp$. But these three theorems are incompatible. Letting "$\Pi$" be the universal quantifier, from (3) it follows that $N\Pi pNKMpMNp$, or that all propositions are possible. But (1) and (2) entail that all modal propositions are equivalent to non-modal. Together (1), (2), and (3) entail that all propositions are valid. According to Lukasiewicz the only way out of this muddle is to deny the Principle of Bivalence.

But while Lukasiewicz's schematization of (1) is straightforward, his rendering of (2) and (3) seems to be not so indisputable as he contended. The intuition underlying theorem (2) is better captured by $NMCpNp$, for here the impossibility concerns making the supposition of $p$ and the inference that $\sim p$ also holds. On Lukasiewicz's rendering, $p \supset \Diamond p$ (by [1]), $\Diamond p \supset p$ (by [2]), and therefore $p \equiv \Diamond p$, or in other words, modal propositions are equivalent to their non-modal counterparts. But if we render (2) as I have suggested, no such modal collapse occurs. With regard to (3) Lukasiewicz seems to have reasoned that because for some $p$ it is the case that $(\Diamond p \cdot \Diamond \sim p)$, therefore it is false that

4. For all $p$, it is not the case $(\Diamond p \cdot \sim p)$,

which he apparently takes to entail

5. For all $p$, it is the case that $(\Diamond p \cdot \sim p)$.

But clearly the falsity of (4) does not entail (5), for these are contraries, not contradictories, and can both be false. The falsity of (4) entails that for some $p$, it is the case that $(\Diamond p \cdot \Diamond \sim p)$, which is theorem (3). It is difficult to believe that Lukasiewicz could have made such a blunder, and perhaps I have misunderstood him, but in that case I do not understand how he concluded that (3) entails the possibility of all propositions. Hence, his claim that these three theorems properly understood are incompatible seems unwarranted.

6. Ibid., p. 53.
7. Ibid., p. 55.
8. Storrs McCall, "Excluded Middle, Bivalence, and Fatalism," *Inquiry* 9 (1966): 384-6; cf. idem, "Temporal Flux," *American Philosophical Quarterly* 3 (1966): 277-9.
9. Storrs McCall, critical review of *Fate, Logic and Time* by Steven M. Cahn, *Journal of Philosophy* 65 (1968): 742-6.
10. Susan Haack, *Deviant Logic: Some philosophical issues* (Cambridge: Cambridge University Press, 1974), p. 56.
11. See Nicholas Rescher, *Many-valued Logic* (New York: McGraw-Hill, 1969), pp. 149-52.
12. Haack, *Deviant Logic*, p. 71.
13. Ibid.
14. D. C. Williams, "The Sea Fight Tomorrow," in *Structure, Meaning, and Method*, ed. Paul Henle, Horace M. Kallen, and Susanne K. Langer, with

a Foreword by Felix Frankfurter (New York: Liberal Arts Press, 1951), p. 285.

15. Charles A. Bayliss, "Are Some Propositions Neither True nor False?" *Philosophy of Science* 3 (1936): 159.

16. Steven M. Cahn, *Fate, Logic and Time* (New Haven, Conn.: Yale University Press, 1967), pp. 107-12. Cf. J. R. Lucas, *A Treatise on Time and Space* (London: Methuen, 1973), p. 294.

17. Tobias Chapman, "On a New Escape from Logical Determinism," *Mind* 81 (1972): 597-9.

18. Steven M. Cahn, "Statements of Future Contingencies," *Mind* 83 (1974): 574.

19. Richmond H. Thomason, "Indeterminist time and truth-value gaps," *Theoria* 36 (1970): 264-81. For Van Fraassen's work, see Bas Van Fraassen, "Singular Terms, Truth Value Gaps, and Free Logic," *Journal of Philosophy* 63 (1966): 481-95; idem, "Presupposition, Implication, and Self-reference," *Journal of Philosophy* 65 (1968): 136-51; idem, "Presuppositions, Supervaluations and Free Logic," in *The Logical Way of Doing Things*, ed. K. Lambert (New Haven, Conn.: Yale University Press, 1969), pp. 67-91.

20. Haack, *Deviant Logic*, p. 58.

21. Nicholas Rescher, *Many-valued Logic* (New York: McGraw- Hill, 1969), pp. 206-12. Cf. A. A. Zinov'ev, *Philosophical Problems of Many-valued Logic*, rev. ed., trans. Guido Küng and David Comey, Synthese Library (Dordrecht, Holland: D. Reidel, 1963), p. 98.

22. Taylor's argument against Excluded Middle need not detain us (Richard Taylor, "Fatalism," *Philosophical Review* 71 [1962]: 64-65). For his argument assumes that his analysis of "within my power" is correct, and its premisses may be denied without assuming Excluded Middle. As for Cahn's claim that fatalism follows even if Excluded Middle is denied, it is perhaps the best *reductio ad absurdum* proof against Taylor's argument, for it shows that if one accepts his analysis of conditionship, causation, and "within my power," then, if Bivalence is denied, one is incapable of performing any action.

23. Tobias Chapman, *Time: a Philosophical Analysis*, Synthese Library (Dordrecht, Holland: D. Reidel, 1982), pp. xi - xii. One cannot resist commenting on the atrocious editing of this volume. Errors appear on nearly every page, some quite amusing. My favorite concerns Chapman's discussion of aphasia, a mental disorder in which the sufferer lives mentally in the past. In what must surely be an Italian asphasiac's nightmare, Chapman writes, ". . . we can imagine grounds for saying that a person suffering from aphasia had forgotten that people have pasta at all"! (Ibid., p. 132)

24. McCall, "Excluded Middle," p. 386.

25. McCall, "Temporal Flux," pp. 273-4.

26. Storrs McCall, "Objective Time Flow," *Philosophy of Science* 43 (1976): 337-62.

27. Nicholas Rescher and Alasdair Urquhart, *Temporal Logic*, Library of Exact Philosophy (New York: Springer-Verlag, 1971), p. 71.

28. Ibid., pp. 72-3.

29. Ibid., pp. 197-8.

30. Ibid., p. 200.

31. Ibid., p. 210.

32. Ibid., p. 211.

33. Ibid.

34. Ibid., p. 212.

35. Ibid., pp. 31-2.

36. This conclusion takes on special importance *vis-à-vis* those who reject an A-theory precisely because of its alleged denial of Bivalence. Horwich, for example, seems to equate the tree-model of reality with the denial of Bivalence

for future contingent propositions; similarly he seems to equate the logical determinacy of the future with the actuality of the future. By exposing the fallaciousness of fatalism, he believes he has removed any reason for adopting the tree model and, hence, the A- theory (Paul Horwich, *Asymmetries in Time* [Cambridge, Mass.: MIT Press, 1987], pp. 27-30). But the salient feature of the tree model that wins consistency for the A-theory contra McTaggart is tensed facts. By holding to tensed facts, one may accept Bivalence and the A-theory. The future need not be actual in order to be logically determinate. Finally, the proper reason for adopting an A-theory with its tree model is that it gives the best account of time and becoming.

37. See Richard Gale, "Endorsing Predictions," *Philosophical Review* 70 (1961): 376-85, who argues that in saying a prediction is neither true nor false now we are stating that in view of the evidence it is not justified at this time to endorse the prediction one way or the other. With regard to an *antiphasis* of future contingent propositions, one may endorse the logical disjunction as a necessary semantic truth, but it would be irresponsible to endorse one disjunct rather than the other owing to the lack of evidence. If "*S* is *P*" is now true, then "*S* will be *P*" was true, but that does not mean that there was sufficient evidence to justify its endorsement at that time.

38. For example, Toms asserts that any future contingent proposition *p* is not true because there is no present fact to make *p* true. "Now the question is whether *p* *is* true, and the fact we are looking for can therefore *only* be a *present* fact if it is to verify *p*" (Eric Toms, "The Law of Excluded Middle," *Philosophy of Science* 8 [1941]: 36). See reply by Ducasse in note 43. See also Margery Bedford Naylor, "Fatalism and Timeless Truth," in *Time and Cause*, ed. Peter Van Inwagen, Philosophical Studies Series in Philosophy 19 (Dordrecht, Holland: D. Reidel, (1980), p. 60; unfortunately her subsequent discussion seems very confused: she claims that $E$'s occurring at $t_2$ is not a sufficient condition of its being true at $t_1$ that "$E$ will occur at $t_2$" because $E$'s occurring at $t_2$ is not sufficient for its being the case that $t_1$ is earlier than $t_2$. But surely it is a logical truth that $t_1 < t_2$. She also objects to $E$'s being the necessary condition of the truth of the above proposition because (i) this violates the unalterability of the past—a typical fatalistic claim which we shall have ample room to refute—and (ii) this is self-contradictory, since at $t_1$ the condition is both met and unmet—a pseudo-contradiction which arises by failing to see that a future event supplies the present truth conditions of a future-tense proposition.

39. For a further critique of what he calls the half-way theory of time, see Paul Fitzgerald, "Is the Future Partly Unreal?" *Review of Metaphysics* 21 (1967-68): 421-46. He distinguishes three views concerning the reality of the future: the empty future theory, the half-way theory, and the full-future theory. Unfortunately, his main objection to the empty future view (a pure A-theory) is that it is committed to a denial of Bivalence for future-tense propositions and hence denies any knowledge of the future. Fitzgerald thus tends to reduce the ontological question to the question of the truth of future-tense propositions, which leads him to an unwarranted rejection of the empty future theory.

40. Rescher, *Many-Valued Logic*, pp. 2-3.

41. Bayliss, "Neither True Nor False?" p. 162. Similarly, Bradley asserts, "The truth of a proposition about the future implies, not that something is the case, but that something will be the case, just as a proposition about the past implies, not that something in the past exists *now*, but that something in the past did exist—in the past" (R. D. Bradley, "Must the Future Be What It is

Going to Be?" *Mind* 68 [1959]: 204). See also A. J. Ayer, *The Problem of Knowledge* (London: Macmillan, 1956), p. 187.

42. Thomas Bradley Talbott, "Fatalism and the Timelessness of Truth" (Ph.D. dissertation, University of California at Santa Barbara, 1974), pp. 153-4.

43. Bayliss, "Neither True Nor False?" pp. 162-3. Cf. a good statement of this point by Ducasse: "What does happen to some propositions is . . . verifiability in the *first* of . . . two senses. That is, on a certain day *we become able* to apply to certain propositions the truth-evaluation procedure. But verifiability in this sense is not at all the same thing as truth: for a proposition verifiable in this sense may even turn out to be false. Again, of course, not only verifiability in this sense, but also *verification*, happens on a certain day to certain propositions; and when one says that verification happens to them on that day one may mean either *only* on that day the truth-evaluation procedure is actually applied to them, or *in addition* that its outcome turns out to be, specifically, the verificatory not the confutory one. But even verification in the latter specific sense on a certain day does not *confer* truth on the proposition; it only *reveals to us* the truth of the proposition, that is, the verifiability of it in the second of the two senses . . . " (C. J. Ducasse, "Truth, Verifiability, and Propositions about the Future," *Philosophy of Science* 8 [1941]: 332-3). The second sense of "verifiability" is the capacity to be true (or false). In this sense, future-tense propositions have always been "verified," *i.e.*, made true (or false), in virtue of what states of affairs would obtain. See also Bradley, "Must the Future Be?" p. 197.

44. Arthur N. Prior, "The Formalities of Omniscience," in *Papers on Time and Tense*, by A. N. Prior (Oxford: Clarendon Press, 1968), p. 36.

45. Bayliss suggests the trichotomy "known to be true," "known to be false," "not known to be either." But this seems unacceptable, since then $p \cdot \sim p$ could not be known to be false, nor $p \lor \sim p$ known to be true, where $p$ is a future contingent proposition. But under the interpretation of empirical determinability, these formulae, while not empirically determinable, are nevertheless known to be a necessary falsehood or truth respectively.

   Similarly, Purtill's suggestion that we replace Bivalence for future contingent propositions with a multi-valued logic representing various degrees of probability properly concerns their epistemic status, not their varying degrees of truth (Richard L. Purtill, "Fatalism and the Omnitemporality of Truth," *Faith and Philosophy* 5 [1988]: 187-89).

46. Zinov'ev, *Many-valued Logic*, p. 104.

47. Bayliss, "Neither True Nor False?" p. 166.

48. Prior, "Formalities of Omniscience," pp. 38-40; idem, *Past, Present and Future* (Oxford: Clarendon Press, 1967), p. 129. Cf. Charles Hartshorne, "The Meaning of 'Is Going to Be'," *Mind* 74 (1965): 46-58. According to Hartshorne, "*x* will do *A*" means "*x*'s doing *A* is already determined" while "*x* will not do *A*" means "none of the now causally open possibilities include *x*'s doing *A*." Thus, it is false that "*x* will do *A*" and false that "*x* will not do *A*," but nevertheless true that "*x* may-or-may-not do *A*." Hartshorne's case is, however, mere assertion without supporting argumentation and, as Cahn points out, violates the Law of Contradiction and the Law of Excluded Middle (Cahn, *Fate*, pp. 61-3).

49. A. N. Prior, "Contemplation and Action," in *Papers on Time and Tense*, by A. N. Prior (Oxford: Clarendon Press, 1968), p. 49.

50. Taking (18) rather than (17′) as the contradictory of (15′) vitiates Cahn's argument that Prior's view violates the Law of Contradiction, for Cahn assumes (17′) is the contradictory of (15') (Cahn, *Fate*, pp. 64-5).

51. Arthur N. Prior, "Indentifiable Individuals," in *Papers on Time and Tense*, by A. N. Prior (Oxford: Clarendon Press, 1968), pp. 66-77. Cf. idem, *Past, Present and Future*, pp. 139- 41; also Gilbert Ryle, *Dilemmas* (Cambridge: Cambridge University Press, 1954), p. 27. *Contra* Ryle, see Naylor, "Fatalism," p. 61.

52. Alvin Plantinga, *The Nature of Necessity* (Oxford: Clarendon Press, 1974), p. 151; cf. chaps. 6-8.

53. In the same vein as Prior, Gustafson asserts that a sentence with the indexical "this" must by convention pick out an object that already exists. Since singular sentences depend on the use of such demonstratives or the possibility of their substitution for grammatical subjects, singular sentences in the future-tense cannot be used to convey singular propositions (Donald F. Gustafson, "Assertions about the Future," *Philosophy and Phenomenological Research* 26 [1965-6]: 424-5).

54. More recently, and substantively, Fine has argued that a haecceity must be of something and so an unexemplified haecceity cannot exist unless there are also corresponding merely-possible objects (Kit Fine, "Plantinga on the Reduction of Possibilist Discourse," in *Alvin Plantinga*, ed. J. E. Tomberlin and P. van Inwagen, Profiles 5 [Dordrecht: D. Reidel, 1985], pp. 148-55). But as Plantinga points out, just as my brother-in-law can exist without me but would not then stand in the "is the brother-in-law of" relation to me, so an unexemplified haecceity can exist but would not then stand in the "is the this-ness of" relation to anything (Alvin Plantinga, "Reply to Kit Fine," in *Plantinga*, p. 335).

55. A. N. Prior and Kit Fine, *Worlds, Times and Selves* (Amherst, Mass.: University of Massachusetts Press, 1977), pp. 102-15.

56. Ibid., pp. 116-18.

57. Alvin Plantinga, "On Existentialism," *Philosophical Studies* 44 (1983): 1-20.

58. See a good statement of this point in Richard M. Gale, "The Open Future: Introduction," in idem, ed. *The Philosophy of Time: a Collection of Essays* (New Jersey: Humanities Press, 1968), pp. 176-7. He notes that proper names of even past individuals may need the backing of such definite descriptions, *e.g.*, which "Caesar" is Prior referring to? Of course, it is unquestionably true that there is more chance of failure when we attempt to refer to a future as opposed to a past individual, since we have traces only of the past; but this epistemic risk is irrelevant to the purported unidentifiability of future individuals.

59. Ibid., p. 176.

60. Cf. statement of this alternative in Haack, *Deviant Logic*, p. 47.

61. R. D. Bradley, "Future," p. 201. Cf. the similar views of John Turk Saunders, "A Sea Fight Tomorrow?" *Philosophical Review* 67 (1958): 367-78; idem, "The Temptations of Powerlessness," *American Philosophical Quarterly* 5 (1968): 107.

62. William Kneale and Martha Kneale, *The Development of Logic* (Oxford: Clarendon Press, 1962), p. 48-9.

63. Ibid., p. 51.

64. See, for example, Arthur C. Danto, *Analytic Philosophy of History* (Cambridge University Press, 1968), pp. 198-200; Cahn, *Fate*, pp. 34-5.

65. Robert P. McArthur, "Timelessness and Theological Fatalism," *Logique et analyse* 20 (1977): 482.

66. Chapman, *Time*, pp. 65-6.

67. Prior, *Past, Present, and Future*, p. 12. He also notes that events occurring prior to human consciousness could on this view only be past, not present

or future, which is absurd (Arthur N. Prior, "On Spurious Egocentricity," in idem, *Papers on Time and Tense* [Oxford: Clarendon Press, 1968], p. 20).

68. Talbott, "Fatalism," p. 154. Gale points out that "this utterance" means "the utterance I am making at present" (Richard M. Gale, "The Static versus the Dynamic Temporal: Introduction," in *Philosophy of Time*, p. 81). Gale also presses this "telling objection" against the token-reflexive analysis: "The chair is now red" cannot mean "The chair's being red is simultaneous with this token" because the latter entails that a token exists, whereas the former does not, and statements with different entailment relations cannot mean the same thing. "The chair is now red, even though no token occurs" is contingently false and self-stultifying, like "I do not exist," but it is not self-contradictory, as is "The chair's being red is simultaneous with this token, even though no token occurs" (Richard M. Gale, "Human Time: Introduction," in *Philosophy of Time*, pp. 296-7).

69. David Lewis, "Attitudes *De Dicto* and *De Se*," *Philosophical Review* 88 (1979): 513-43.

70. Jonathan L. Kvanvig, *The Possibility of an All-Knowing God* (New York: St. Martin's, 1986), pp. 66-70.

71. Ibid., p. 158.

72. Bradley, "Must the Future Be?" pp. 199, 203.

73. W. Kneale, "Time and Eternity in Theology," *Proceedings of the Aristotelian Society* 61 (1960-1): 98.

74. M. Kneale, "Eternity and Sempiternity," *Proceedings of the Aristotelian Society* 69 (1968-9): 228.

75. Talbott, "Fatalism," p. 173. Cf. his claim that to say truth is timeless amounts to saying that *p* cannot have different truth values at different times (Ibid., p. 101).

76. A point also made by T. Chapman, "Determinism and Omniscience," *Dialogue* (Canada) 9 (1970): 370.

77. G. H. von Wright, "Time, Truth and Necessity," in *Intention and Intentionality*, ed. Cora Diamond and Jenny Teichman (Brighton, England: Harvester Press, 1979), p. 241; Rogers Albritton, "Present Truth and Future Contingency," *Philosophical Review* 66 (1957): 30-2.

78. See discussion in McArthur, "Timelessness," pp. 486-8. McArthur's argument, however, is inadequate, since he shows only that if it is possible that God has communicated His timeless knowledge to some temporal knower, then foreknowledge on the part of this knower is possible. But mere possibility of foreknowledge does not entail fatalism. See also Stephen Richard Boothe, "Temporal Necessity and Divine Foreknowledge" (Ph.D. dissertation, University of California at Irvine, 1978), pp. 85- 7, who argues similarly to Helm that "It was the case that God timelessly believes *p*" was true in the past.

79. Paul Helm, "Timelessness and Foreknowledge," *Mind* 84 (1975): 524-7.


## NOTES TO CHAPTER FIVE

1. Douglas P. Lackey, "A New Disproof of the Compatibility of Foreknowledge and Free Choice," *Religious Studies* 10 (1974): 313.

2. Diodorus Cronus, "Time, Truth and Ability," *Analysis* 25 (1964-65): 137-41. The identity of the modern day Diodorus is disclosed by Richard M. Gale, ed., *The Philosophy of Time: a Collection of Essays* (New Jersey: Humanities Press, 1968), p. 510.

3. For a sharp critique of Taylor's article, see Yehoshua Bar-Hillel, "Et tu, Diodorus Cronus?" *Analysis* 26 (1965-66): 54- 6; for a less interesting response, see Arthur W. Collins, "On Dating Abilities and Truths," *Analysis* 26 (1965-66):

51-3. Coming to Taylor's defense against Bar-Hillel is the indefatigable Steven Cahn, "An Unanswered Paradox," *Analysis* 26 (1965-66): 203-6.

4. Keith Lehrer and Richard Taylor, "Time, Truth and Modalities," *Mind* 74 (1965): 390-8.

5. James E. Tomberlin, "A Fatalistic Paradox Examined," *Philosophy and Phenomenological Research* 39 (1978-79): 589-91. Tomberlin's solution is to affirm the first objection, but he does not explain why Lehrer and Taylor's refutation of that objection fails. He also maintains that (3) may be read as a material conditional, in which case (6) does not follow, or it may be read as an assertion of physical or logical necessity, in which case it is false, since Smith could be killed prior to arrival. But again Lehrer and Taylor have already rejected such an interpretation of (3).

6. Lehrer and Taylor, "Modalities," p. 397.

7. Richard Taylor, "Prevention, Postvention, and the Will," in *Freedom and Determinism*, ed. Keith Lehrer (New York: Random House, 1966; rep. ed.: Atlantic Highlands, New Jersey: Humanities Press, 1976), p. 73.

8. Charles A. Bayliss, "Are Some Propositions Neither True Nor False?" *Philosophy of Science* 3 (1936): 161-2.

9. The illustration is really unintelligible since while one waits for the wheel to stop, one is exercising one's ability to not-move [or move] his finger; since the alternatives are contradictories one or the other must obtain. It would be absurd to deny Excluded Middle in this situation. Even a paralytic would have the power to not-move his finger. The illustration should be constructed so that I shall, say, move my finger right or left depending on the wheel's outcome. On Taylor's analysis, it is not within my power to move my finger in either direction until the wheel stops.

10. Cf. the discussion by Paul Helm, "Foreknowledge and Possibility," *Canadian Journal of Philosophy* 6 (1976): 731-4, of an earlier piece by Dennis C. Holt, "Foreknowledge and the Necessity of the Past," *Canadian Journal of Philosophy* 6 (1976): 721-36. Holt imagines a person in prison who resolves irrevocably to take poison on a certain day, but then finds on the day before his suicide that he has the opportunity to escape. But is it within his power to do so? Holt thinks that if he has confided his irrevocable decision to a fellow prisoner then that other prisoner knows he will take poison and not escape, so that escape is not within his power. Helm rightly points out that the confiding is wholly irrelevant. Though he has the physical ability and opportunity to escape, he is rendered powerless by his irrevocable decision to take the poison. He has, says Helm, made himself powerless by his irrevocable decision. This discussion makes it clear again that the sense of "powerlessness" operative here is, despite Helm's disclaimer, the inability to make a logical contradiction true. In every other sense, it is within the man's power to escape; but *given* that he will not escape, he cannot escape; *i.e.*, it is impossible that he escape if he does not escape.

11. For the charge that Taylor equivocates between causal and logical interpretations of "necessary condition," see Charles D. Brown, "Fallacies in Taylor's 'Fatalism'," *Journal of Philosophy* 62 (1965): 349-53; D. Holdcroft, "Escaping Taylor's Fate," *Ratio* 15 (1973): 303-14; Martin Bertman, "Logical Fatalism and the Excluded Middle," *New Scholasticism* 50 (1976): 481-9; Irving Thalberg, "Fatalism Toward Past and Future," in *Time and Cause*, ed. Peter Van Inwagen, Philosophical Studies Series in Philosophy 19 (Dordrecht, Holland: D. Reidel, 1980), pp. 33; Robert Segal, "Fatalism," *Pacific Philosophical Quarterly* 62 (1981): 371.

12. Hence, the irrelevance of the attempt of William L. Rowe, "Fatalism and Truth," *Southern Journal of Philosophy* 18 (1980): 217, to revise Taylor's

(Presupp.5) to read, "If $x$ is a necessary condition for my doing $y$ and $x$ is absent, then doing $y$ is within my power only if bringing about $x$ is within my power." This neither clarifies "within my power" nor resolves the question of fatalism. For if $x$ is the event of the battle tomorrow and $y$ is my giving the order today, it is within my power to bring about $x$ precisely by doing $y$; but doing $y$ is within my power only if bringing about $x$ is within my power. Which leaves us where?

13. So also James E. Tomberlin, "The Sea Battle Tomorrow and Fatalism," *Philosophy and Phenomenological Research* 31 (1970-71): 354. As McCall explains, the presence or absence of any necessary future condition of giving the order at $t_1$ is not relevant to one's ability to give the order, but to whether one does give the order (Storrs McCall, critical review of *Fate, Logic and Time*, by Steven M. Cahn, *Journal of Philosophy* 65 [1968]: 745; so also Robert Young, *Freedom, Responsibility, and God*, Library of Philosophy and Religion [New York: Barnes & Noble, 1975], pp. 23-4). Similarly Haack observes that "If $e$ will happen, then it cannot be prevented" is equivalent to "Necessarily, if $e$ will happen, then it *will not* be prevented," which is a "harmless truism" (Susan Haack, *Deviant Logic: Some philosophical issues* [Cambridge: Cambridge University Press, 1974], p. 80).

14. Roger Wertheimer, "Conditions," *Journal of Philosophy* 65 (1968): 355-64.

15. David H. Sanford, "The Direction of Causation and the Direction of Conditionship," *Journal of Philosophy* 73 (1976): 199, 204, accepts Wertheimer's analysis, but holds that the relation of conditionship is non-symmetric, rather than asymmetric; *i.e.*, if P is a sufficient condition of Q, it follows neither that Q is a necessary condition of P nor that it is not. According to Sanford, Q is a necessary condition of P iff Q is necessary for P and there are admissible circumstances in which everything necessary for Q is necessary for P. Sanford's analysis is compatible with backward causation, but, contra Taylor and Chisholm, the morrow's sea battle cannot, I think, be plausibly construed as the cause or condition of my giving an order today. Therefore, Sanford's difference with Wertheimer does not affect the analysis of fatalism. (See Graham Nerlich, "Time and the Direction of Conditionship," *Australasian Journal of Philosophy* 57 [1979]: 3-14, who argues that despite Sanford's admission of the possibility of backward causation, his rejection of the symmetry of conditionship survives intact.)

16. This brings to mind the discussion of P. B. Downing, "Subjunctive Conditionals, Time Order, and Causation," *Proceedings of the Aristotelian Society* 59 (1958-59): 125-40. He uses the illustration of an absolutely reliable weather glass in order to justify a distinction between subjunctive conditionals and subjunctive implications. According to Downing, it is the case that

(1) If the weather were going to be fair, then the glass would read 'fair.'
But it is not the case that

(2) If the glass read 'fair,' then the weather would be fair.
If, *per impossibile*, the glass read 'fair' when the weather was going to be dull, then the weather would be dull; that is to say, the reading of the glass is not properly a condition of the ensuing weather. Therefore, (2) is not analyzable in terms of subjunctive *conditionals*, but rather in terms of subjunctive *implications*. He contrasts to this the illustration of an absolutely reliable detonator; here subjunctive conditionals like

(3) If the detonator handle were pressed, an explosion would occur
are entirely in order, for it is a matter of causal efficacy. Downing's attempt to make this distinction seems to me to be rooted in the same intuitions concerning conditions and consequences that inspire Wertheimer. For the reading of the glass is not a condition, but rather a consequence, of the weather.

Hence, it would be foolish to argue, for example, that because the glass does not read 'fair,' it is fated or necessary that the weather will be dull. On the contrary, because the weather will be dull, the glass does not read 'fair.'

See also Jaegwon Kim, "Noncausal Connections," *Noûs* 8 (1974): 41-52, who, analyzing the propositions "Socrates died" and "Xantippe became a widow," notes that though these logically entail each other, nevertheless Xantippe's widowhood depends somehow on Socrates's death, but not *vice versa*. This is another good example of the difference between condition and consequence pointed out by Wertheimer.

For an application to theological fatalism, see Stephen T. Davis, *Logic and the Concept of God* (Grand Rapids, Mich.: Wm. B. Eerdmans, 1983), p. 53; he argues that divine foreknowledge and human freedom are consistent if it is possibly true that "What God knew yesterday is contingent upon what we shall freely decide to do tomorrow," or in other words, one's free action is the condition of what God foreknows.

17. Cf. the remarks of Steven M. Cahn, *Fate, Logic, and Time* (New Haven: Yale University Press, 1967), pp. 41-2, where he claims that the truth of the proposition "I shall do $x$" does not force me to do $x$, but that the state of affairs described by that proposition does force me to do $x$. Wertheimer's analysis helps us to see the absurdity of such reasoning.

18. Alfred J. Freddoso, "Accidental Necessity and Power over the Past," *Pacific Philosophical Quarterly* 63 (1982): 60; so also Paul Horwich, *Asymmetries in Time* (Cambridge, Mass.: MIT Press, 1987), p.30, who emphasizes that this is not a matter of backward causation.

19. Freddoso, "Power," p.67.

20. Ibid.

21. Joshua Hoffman and Gary Rosenkrantz, "On Divine Foreknowledge and Human Freedom," *Philosophical Studies* 37 (1980): 289-96.

22. Freddoso, "Power," p. 64; cf. a similar endorsement by E. M. Zemach and D. Widerker, "Facts, Freedom, and Foreknowledge," *Religious Studies* 23 (1987): 20.

23. Cahn, *Fate*, p. 32.

24. A distinction drawn, for example, by A. E. Dummett, "Can an Effect Precede its Cause?" in *Belief and Will*, Aristotelian Society Supplementary Volume 28 (London: Harrison & Sons, 1954), p. 41; Michael Scriven, "Randomness and the Causal Order," *Analysis* 17 (1956-7): 8; Richard Swinburne, "Affecting the Past," *Philosophical Quarterly* 16 (1966): 342-3; Bob Brier, "Magicians, Alarm Clocks, and Backward Causation," *Southern Journal of Philosophy* 11 (1973): 361; Larry Dwyer, "How to Affect, but not Change, the Past," *Southern Journal of Philosophy* 15 (1977): 383.

25. Richard Taylor, "The Problem of Future Contingencies," *Philosophical Review* 66 (1957): 11. Taylor's views seemed to vacillate on this score. In his piece on fatalism, he denies that time itself imposes necessity on things. The future is as unalterable as the past, granted Excluded Middle for future-tense propositions. Similarly, in the piece on backward causation, he maintains that our ability to influence the past is comparable to our ability *vis à vis* the future. Later he denied that we can influence the past, affirming that we can cause only the future. In any case, he never affirmed that we could *change* the past; but if we can similarly influence the future without changing it, then Taylor's argument for fatalism based on the unchangeability of the past becomes vacuous.

26. As Makepeace explains, my inability to change the past is simply a matter of logic; if it is the case that $x$ happened, then it is not the case that $x$ did not happen, and the fact that we cannot change the past is the same as our

not being able to construct round squares (Peter Makepeace, "Fatalism and Ability II," *Analysis* 23 [1962-63]: 29).

27. A. J. Ayer, *The Problem of Knowledge* (London: Macmillan, 1956), p. 189. Cf. R. D. Bradley, "Must the Future Be What It Is Going to Be?" *Mind* 68 (1959): 196. Bradley defends what he calls "logical determinism" with regard to past, present, and future states of affairs; *i.e.*, the view that everything is determinate in that it is what it is and cannot be otherwise. His view would more appropriately be called "logical determinacy," since it is neither deterministic nor fatalistic. (Cf. Lewis Foster, "Fatalism and Precognition," *Philosophy and Phenomenological Research* 31 [1970-71]: 343-4, on the distinction between the future's being predeterminate and predetermined.) This led one frustrated critic to complain that Bradley's logical determinism is nothing more than the laws of logic applied to past, present, and future propositions. Thus if *e* is going to take place, then *e* must take place if it is going to be *e*. But this is a mere tautology; we can easily agree that it is not fatalistic, but no one has attacked so innocuous a doctrine (Peter Wolff, "Truth, Futurity, and Contingency," *Mind* 69 [1960]: 398-402). Ironically, in the ensuing years this innocuous doctrine was attacked as being fatalistic by both logical and theological fatalists.

28. Anthony Kenny, "Divine Foreknowledge and Human Freedom," in *Aquinas: a Collection of Critical Essays*, ed. Anthony Kenny, Modern Studies in Philosophy (Garden City, N.Y.: Doubleday; Anchor Books, 1969), p. 267.

29. Rowe, "Fatalism," p. 213. Cf. Cahn's rejoinder to Makepeace.

30. Ayer, *Knowledge*, p. 191.

31. Ibid.

32. Taylor, "Postvention," p. 73.

33. Richard Taylor, "Causation," *Monist* 47 (1962-63): 308- 11.

34. Richard Taylor, "Can a Cause Precede its Effect?" *Monist* 48 (1964): 136-42.

35. See Dummett, "Effect Precede its Cause?" pp. 29-31.

36. As Bradley observes, "In a strict sense what the future holds for us cannot be altered for it would then not be part of the future . . . . The notion of 'altering' bedevils the real issue which is not whether the future will be what it is to be but rather *what* it is to be owes anything to our present and future efforts and activities . . ." (Bradley, "Future," p. 205).

37. See good statements of this point in Ayer, *Knowledge*, p. 192; Kenny, "Foreknowledge and Freedom," p. 268.

## NOTES TO CHAPTER SIX

1. In his *De divina omnipotentia* Peter Damian argued that God in virtue of His timelessness has the power to bring it about that a woman who has lost her virginity has never lost her virginity. See Peter Damian, *De divina omnipotentia in reparatione corruptae, et factis infectis reddendis*, in *Patrologia Latina*, ed. J. P. Migne (Petit-Montrouge: 1853), vol. 145, pp. 595-622. For an English translation, see J. F. Wippel and Alan B. Wolter, eds. *Medieval Theology from St. Augustine to Nicholas of Cusa*, Readings in the History of Philosophy (New York: The Free Press, 1969), pp. 143-52. For discussion, see William J. Courtenay, "John of Mirecourt and Gregory of Rimini on whether God can Undo the Past," *Recherches de théologie ancienne et médiévale* 39 (1972): 224-56; 40 (1973): 147-74; R. P. McArthur, "Peter Damian and Undoing the Past," *Philosophical Studies* 25 (1974): 137-41; Peter Remnant, "Peter Damian: Could God Change the Past?" *Canadian Journal of Philosophy* 8 (1978): 259-68; Anthony Kenny, *The God of the Philosophers* (Oxford: Clarendon Press, 1979), pp. 101-2. Technically, however, God's power over the past

is not a matter of backward causation because on Peter's view God is not in time. It is more analogous to a timeless being's ability, confronted with a B-series universe, to bring about events at any point on the time-line.

2. A. E. Dummett and A. Flew, "Can an Effect Precede its Cause?" in *Belief and Will*, Aristotelian Society Supplementary Volume 28 (London: Harrison and Sons, 1954), pp. 27-62.

3. Michael Dummett, "Bringing about the Past," *Philosophical Review* 73 (1964): 338-59; a third piece by Dummett is his popular lecture, "Causal Loops," in *The Nature of Time*, ed. R. Flood and M. Lockwood (Oxford: Basil Blackwell, 1986), pp. 135-69, but apart from remarks on time travel and Newcomb's Paradox, it adds little new.

4. Ibid., p. 348.

5. See also Jordan Howard Sobel, "Dummett on Fatalism," *Philosophical Review* 75 (1966): 78-90. He notes that "You will be killed whatever precautions you take" is patient of an indicative and a subjunctive interpretation and that the subjunctive may be true though the indicative is false.

6. Dummett, "Bringing About the Past," p. 348.

7. Steven M. Cahn, *Fate, Logic, and Time* (New Haven: Yale University Press, 1967), pp. 19-20.

8. Dummett, "Bringing about the Past," pp. 358-9.

9. Dummett and Flew, "Effect Precede its Cause," p. 45. For a good statement of his position, see *Encyclopedia of Philosophy*, s.v. "Precognition," by Antony Flew. There he asserts that the proposition, "A cause must either precede or be simultaneous with its effect" is a necessary truth, the opposite of which is as impossible as a bachelor husband; and the impossibility is of the same sort in both cases. This is not, however, a mere matter of definition, but is grounded in a more fundamental necessity. Causes are levers for bringing about their effects, but a retro-cause could not be used as a lever. For once the effect has happened it must be too late for any cause to bring it about, and too late also for it to be prevented by preventing its cause.

10. See Max Black, "Why Cannot an Effect Precede its Cause?" *Analysis* 16 (1955-56): 49-58; Antony Flew, "Effects before their Causes–Addenda and Corrigenda," *Analysis* 16 (1955-56): 104-10; D. F. Pears, "The Priority of Causes," *Analysis* 17 (1956-57): 54- 63; D. F. Pears, "Time, Truth and Inference," *Proceedings of the Aristotelian Society* 51 (1950-51): 1-24; Roderick M. Chisholm and Richard Taylor, "Making Things to Have Happened," *Analysis* 20 (1959-60): 73-78; William Dray, "Taylor and Chisholm on Making Things to Have Happened," *Analysis* 20 (1959-60): 81.

11. Michael Scriven, "Randomness and the Causal Order," *Analysis* 17 (1956-57): 5-9.

12. Antony Flew, "Causal Disorder Again," *Analysis* 17 (1956-57):81-86.

13. Ibid., p. 85.

14. See also Samuel Gorowitz, "Leaving the Past Alone," *Philosophical Review* 73 (1964): 360-71.

15. Richard M. Gale, "Why a Cause Cannot be Later than its Effect," *Review of Metaphysics* 19 (1965-66): 209-34.

16. Richard Swinburne, "Affecting the Past," *Philosophical Quarterly* 16 (1966): 341-47; idem, *Space and Time* (London: Macmillan, 1968), pp. 157-71.

17. Chapman does distinguish two sorts of retrocausation: (1) cases in which the retroactive cause is open to intentional control of some kind, and (2) cases in which this is not so (T. Chapman, *Time: a Philosophical Analysis*, Synthese Library [Dordrecht: D. Reidel, 1982], p. 34). But this division seems to me inadequate. For as we shall see and as Chapman admits, the arguments against type (1) can be stated in terms of mechanical devices alone; any sense

in which such causal relations are still open to intentional control would also seem to be true of type (2), such as the pre-acceleration of particles in classical electro-dynamics; for the accelerating particle could theoretically, it might be argued, be destroyed before the retroactive force is applied to it. There is a difference, to be sure, between natural backward causes and intentional backward causes, but such a division does not capture anything essentially different in the causation itself. Mackie comes closer to the distinction I am trying to make when he asserts that backward causation is possible, but not the bringing about of the past (J. L. Mackie, *The Cement of the Universe* [Oxford: Clarendon Press, 1974], p. 183). But by this Mackie means that backward causation is possible where the future cause is "fixed" or causally determined so as to be unpreventable, but in cases in which the future cause is not fixed no claim to its retroactively causing an effect can be supported. This, however, again does not distinguish anything about the causation of the purported backward cause and depends on the cogency of Flew's objection, which I hope to show is fallacious.

18. This seems to be borne out by Taylor's subsequent denial of backward causation due to the absence of the notion of power in such a relation.

19. Paul Fitzgerald, "On Retrocausality," *Philosophia* 4 (1974): 514.

20. Bob Brier, "Magicians, Alarm Clocks, and Backward Causation," *Southern Journal of Philosophy* 11 (1973): 361; cf. idem *Precognition and the Philosophy of Science: An Essay on Backward Causation* (New York: Humanities Press, 1974), pp. 27-28.

21. Antony Flew, "Magicians, Alarm Clocks, and Backward Causation: a Comment," *Southern Journal of Philosophy* 11 (1973): 365; contra see Larry Dwyer, "How to Affect, but not Change, the Past," *Southern Journal of Philosophy* 15 (1977): 383.

22. Flew, "Comment," p. 366.

23. For example, J. L. Mackie, "The Direction of Causation," *Philosophical Review* 75 (1966): 449; idem, *Cement*, pp. 168-70. Mackie explicates causal priority in terms of the fixity of the cause over against the lack of fixity of the effect, "fixity" at time $t$ meaning that the event in question has occurred at or before $t$ or a sufficient cause of the event has occurred at or before $t$; if all events are fixed at $t$ then causal priority might be identified with priority with respect to dispersal of order. Mackie's analysis in terms of fixity is inadequate, however, for it cannot account for causal directionality in cases of simultaneous causation and it is doubtful that all such cases involve a priority with respect to the dispersal of order. For a critique of Mackie's analysis, see D. A. Suchting, "Professor Mackie on the Direction of Causation," *Philosophy and Phenomenological Research* 29 (1968-69): 289-91; Myles Brand, "Causality," in *Current Research in Philosophy of Science: Proceedings of the P. S. A. Critical Research Problems Conference*, ed. Peter D. Asquith and Henry E. Kyburg, Jr. (East Lansing, Mich.: Philosophy of Science Association, 1979), pp. 261-63.

24. See comments of Brier, *Precognition*, pp. 91-93. "What is meant by a cause is that which can be used or is effective in bringing about something, and this suggests, as a test, asking which of the two members of a causal relation would be (or is) used to bring about the other" (Ibid., p. 98).

25. Note Kenny's apparent confusion on this point. He demands how we may distinguish causes from effects once backward causation is admitted (Kenny, *God of the Philosophers*, p. 107). But the issue of backward causation is irrelevant to the issue of distinguishing cause from effect unless one merely stipulates the earlier event to be the cause, which solves nothing.

26. Indeed, Von Wright, as we shall see, uses a concept of causal directionality that relies on manipulatability to defend backward causation.

27. Interestingly, Flew is willing to grant a sort of counterfactual dependence of the earlier event upon the later, but denies this is a causal relationship. Some thinkers such as Pollock have argued that what must be added to counterfactual conditions to obtain a correct analysis of causation is a temporal condition, *viz.* that the cause must precede its effect (John L. Pollock, "Causes, Conditionals, and Times," *Pacific Philosophical Quarterly* 62 [1981]: 340-53). In this sense, they agree with Flew concerning the impossibility of backward causation, but beg the question by ruling it out definitionally. In any event, the counterfactual analysis of causation is too broad and would include non-causal relations, *e.g.*, Socrates's drinking hemlock and Xantippe's becoming a widow, and it fails to deal with the problem of overdetermination of an effect (Brand, "Causality," pp. 264-9).

28. Something more needs to be said about whether such knowledge is incompatible with deliberation, but it seems clear that no incompatibility exists with the freedom to do otherwise.

29. Pears's critique of Dummett on this score also seems to be to the point, since there seems to be no reason why a naturally operating backward cause and its effect might both be known by observers (Pears, "Priority," pp. 54-63).

30. See also Brier, *Precognition*, p. 36.

31. Mackie has sought to redefend the "bilking experiment" in cases in which the backward cause is not fixed in advance (Mackie, "Direction of Causation," p. 456). In cases in which the cause has causal antecedents in the present, precognition could be caused by such a future event. But if the future cause depends on a free decision or chance, then the "bilking experiment" does rule out precognition. Mackie, however, has said nothing here to advance the argument. He commits the usual fatalistic fallacy, assuming that if a decision is known in advance to be *x*, then it could not be not-*x*. To repeat, it follows from such precognition only that the decision *will* be *x*, not that it *cannot* be not-*x*. As Anglin urges against Mackie, if the cause does not happen the effect did not happen, and if the cause does happen the effect happened; hence, although one could prevent the cause, the occurrence of the effect means that one does not. Thus, one's failure to bilk the experiment says nothing for fatalism, nor does one's success in bilking the experiment say anything against backward causation. See also Chapman, *Time*, pp. 7, 32-35, who argues that cases of retrocausation in which the causes are under human control are *a priori* impossible because one could always intervene to prevent the cause. But see W. S. Anglin, "Backwards Causation," *Analysis* 41 (1980): 87; also Brier, *Precognition*, p. 87.

32. Chapman, *Time*, p. 7; see also recent discussion in Paul Horwich, *Asymmetries in Time* (Cambridge, Mass.: MIT Press, 1987), pp. 92-101, who concludes that the standard objection based on the bilking experiment is weak, of slight import, and superfluous. Horwich's discussion makes, however, two unnecessary assumptions: (i) that the effect in question is overdetermined by having antecedent as well as future causal conditions, and (ii) that the bilking attempt succeeds in preventing the alleged retro-cause after observation of its purported effect. But backward causation is more clearly at issue when the effect is inexplicable in terms of prior causes. Horwich takes no cognizance of situations in which the effect really is retroactively caused, but would not exist were the cause to be prevented. He assumes that if the cause were prevented, then the past event would not have been the effect of the retro-cause. Thus, when he discusses tachyons and positrons, he asserts that if a return tachyon beam were prevented from being sent, then the reception of that beam would

have been the coincidental arrival of a free tachyon beam, not the return signal; or again, if, having observed a backwardly moving electron, we prevent its future collision, then the observed arrival was that of a random electron. But if it really was the returning tachyon beam or electron we observed, then were the retrocause prevented, why not say that we would have observed nothing at all?

33. A point made by Fitzgerald, "Retrocausality," p. 525.

34. A question also put by Brier, *Precognition*, p. 55.

35. As Brier notes, in order for backward causation to be logically possible, it need not be demonstrated to be the best explanation, but only a possible explanation, true in some possible world; ". . . the discussion of which alternative is more plausible is quite a different question from whether backward causation is logically possible" (Brier, *Precognition*, pp. 5, 7, 31).

36. If there is no change of this sort, but merely the uncovering of new evidence, as Brier points out, then the best evidence is in principle obtainable at the time of the effect (Brier, *Precognition*, pp. 55-56). In this case, Swinburne is merely saying that it is always preferable to hold that the alleged cause actually did nothing.

37. David Lewis, *Counterfactuals*, Library of Philosophy and Logic (Oxford: Basil Blackwell, 1973), pp. 4-9. Lewis does not differentiate between physical and nomological necessity, though these are distinct.

38. Michael J. Loux, "Introduction: Modality and Metaphysics," in *The Possible and the Actual*, ed. Michael J. Loux (Ithaca, N.Y.: Cornell University Press, 1979), p. 27. Although Loux claims that Plantinga makes this identification, I have never seen him do so; but it must be admitted that his colleagues Flint, Freddoso, and Loux do. See the interesting remarks on this head by Alvin Plantinga, "Is Theism Really a Miracle?" *Faith and Philosophy* 3 (1986):117, and especially the illuminating discussions by Thomas V. Morris, *The Logic of God Incarnate* (Ithaca, N.Y.: Cornell University Press, 1986), pp. 111-19 and idem, "Necessary Beings," in idem, *Anselmian Explorations* (Notre Dame, Ind.: University of Notre Dame Press, 1987), pp.179-93. Plantinga points out that broadly logical possibility cannot plausibly be defined in terms of a proposition's freedom from inconsistency in first order logic, for the resources of first order logic do not permit us to deduce a contradiction from propositions like "2+1=7" or "Some prime numbers weigh more than Jackie Gleason," but we should not therefore regard these as possible. Even worse, Morris notes that propositions expressing what seem intuitively to be possible worlds may in fact not be possible because necessarily God would not allow them to obtain. Hence, Morris is forced to distinguish between worlds which are conceivable, but nonetheless impossible. He differentiates three sorts of modal intuitions: (i) those about what is logically possible/impossible in a narrow sense, (ii) those concerning semantic matters such as conceptual truths, (iii) those concerning the status of (i) and (ii), *e.g.*, constraints on possibility deriving from God's nature. Thus, what one judges to be broadly logically possible will be significantly constrained by his attitude toward theism. Now it seems to me that broadly logical possibility has thus become so constrained that it scarcely deserves the name. Perhaps it would be less misleading to restrict it to (i) and (ii) above and call the sphere of worlds accessible according to (iii) the sphere of "metaphysical modality."

39. Loux, "Introduction," pp. 48-49.

40. See Arthur Pap, *Introduction to the Philosophy of Science* (London: Eyre & Spottiswoode, 1963), pp. 97-98; G. J. Whitrow, *The Natural Philosophy of Time*, 2d ed. (Oxford: Clarendon Press, 1980), pp. 40-1.

41. Dray, "Making Things to Have Happened," pp. 79-82.

42. On this approach see Brand, "Causality," pp. 261-64, who notes that it violates the principle that no event causes itself, since everything is the necessary and sufficient condition of itself.

43. Taylor, "Causation," p. 306.

44. G. H. Von Wright, *Explanation and Understanding* (Ithaca, N.Y.: Cornell University Press, 1971), pp. 69-81.

45. Tom L. Beauchamp and Daniel N. Robinson, "On Von Wright's Argument for Backward Causation," *Ratio* 17 (1975): 99-101.

46. Daniel N. Robinson, "Disinhibition of Visually Masked Stimuli," *Science* 154 (1966): 157-58; idem, "Backward Masking, Disinhibition, and Hypothesized Neural Networks," *Perception and Psychophysics* 10 (1971): 33-35.

47. Beauchamp and Robinson, "Backward Causation," pp. 101-03.

48. R. P. Feynman, "The Theory of Positrons," *Physical Review* 76 (1949): 749-59.

49. Jonathan Powers, *Philosophy and the New Physics*, Ideas (London: Methuen, 1982), p. 105. For a further critique of Feynman's proposal, see G. J. Whitrow, *The Natural Philosophy of Time*, 2d ed. (Oxford: Clarendon Press, 1980), pp. 332-35; see also Horwich, *Asymmetries*, pp. 104-05.

50. Championing this claim, for example, is John Earman, "An Attempt to Add a Little Direction to 'The Problem of the Direction of Time'," *Philosophy of Science* 41 (1974): 41; idem, "Causation: A Matter of Life and Death," *Journal of Philosophy* 73 (1976): 13-16.

51. Adolf Grünbaum, "Is Preacceleration of Particles in Dirac's Electrodynamics a Case of Backward Causation? The Myth of Retrocausation in Classical Electrodynamics," *Philosophy of Science* 43 (1976): 165-201; cf. Adolf Grünbaum and Allen I. Janis, "Is There Backward Causation in Classical Electrodynamics?" *Journal of Philosophy* 74 (1977): 475-82.

52. Grünbaum, "Myth of Retrocausation," p. 170.

53. Ibid.

54. Ibid., p. 173. Philosophers at Pittsburgh seem fond of capital letters.

55. Ibid., p. 176.

56. Ibid., p. 184.

57. Ibid., p. 197.

58. Ibid., p. 201. For a critique, see Charles Nissim-Sabat, "On Grünbaum and Retrocausation in Classical Electrodynamics," *Philosophy of Science* 46 (1979): 118-35. But see the excoriating reply of Adolf Grünbaum and Allen I. Janis, "Retrocausation and the Formal Assimilation of Classical Electrodynamics to Newtonian Mechanics: a Reply to Nissim-Sabat's 'On Grünbaum and Retrocausation'," *Philosophy of Science* 46 (1979): 154-55, and again Charles Nissim-Sabat, "Discussion: A Reply to Grünbaum and Janis," *Philosophy of Science* 48 (1981): 129. None of Nissim-Sabat's objections seems to strike at the central issue of whether one's ability to retrodict mathematically the preacceleration of a particle warrants the claim that this is an instance of backward causation. Even the adequacy for classical electrodynamics of the Dirac-Lorentz equation for motion has been called into question. See J. C. Herrera, "Equation of motion in classical electrodynamics," *Physical Review* D 15 (1977): 453-56.

59. Albert Einstein, "Elektrodynamik bewegter Körper," *Annalen der Physik* 17 (1905): 891-921. This is translated in Albert Einstein, *et. al.*, *The Principle of Relativity* (New York: Dover Publications, 1952), pp. 35-65.

60. O. M. Bilaniuk, V. K. Deshpande, E. C. G. Sudarshan, "'Meta' Relativity," *American Journal of Physics* 30 (1962): 718; G. Feinberg, "Possibility of Faster-Than-Light Particles," *Physical Review* 159 (1967): 1089-1105.

61. Olexa-Myron Bilaniuk and E. C. George Sudarshan, "Particles Beyond the Light Barrier," *Physics Today*, May 1969, p. 47.

62. Feinberg, "Faster-Than-Light Particles," p. 1091.
63. Richard C. Tolman, *The Theory of Relativity of Motion* (Berkeley: University of California Press, 1917), pp. 54-55. Actually Tolman's Paradox results not only when infinite velocities are involved, but for all velocities greater than $c^2/w$, where $w$ is the relative velocity of two observers.
64. Olexa-Myron Bilaniuk, *et. al.*, "More About Tachyons," *Physics Today*, December 1969, p. 49; cf. David Bohm, *The Special Theory of Relativity* (New York: W. A. Benjamin, 1965), p. 158.
65. F. A. E. Pirani, "Noncausal Behavior of Classical Tachyons," *Physical Review* D 1 (1970): 3224.
66. Bilaniuk and Sudarshan, "Particles," p. 47. Feinberg explains,

> "Any observer will insist on a time ordering of events consistent with primitive ideas of causality, such as that emission occur before absorption. However, emission generally refers to the production of a positive-energy system and absorption to the destruction of a positive-energy system. It is clear that at a single point there is no distinction between absorption of a positive-energy particle and emission of a negative-energy particle . . . suppose a process occurs which can be interpreted by one observer as emission of a positive energy tachyon at one space-time point and absorption of the tachyon at a later space-time point. For a different, Lorentz-transformed, observer the second point may be earlier in time than the first, and the energy of the tachyon may be transformed to a negative value by the Lorentz transformation. This observer will interpret the process as the emission of a positive-energy tachyon at point 2′ and its absorption at the later point 1′, and therefore need not introduce the concept of negative-energy particles at all" (Feinberg, "Faster-Than-Light Particles," p. 1091).

67. Feinberg, "Faster-Than-Light Particles," p. 1103.
68. Bilaniuk and Sudarshan, "Particles," p. 48.
69. See the remarks of John Earman, "Implications of Causal Propagation outside the Null Cone," *Australasian Journal of Philosophy* 50 (1972): 230-34.
70. See Bilaniuk, *et. al.*, "More About Tachyons," pp. 48-50; G. A. Benford, D. L. Book, W. A. Newcomb, "The Tachyonic Antitelephone," *Physical Review* D 2 (1970): 263-65 [this is the same Newcomb of the famous Newcomb's Paradox]; Pirani, "Noncausal Behavior," p. 3224; Paul Fitzgerald, "Tachyons, Backwards Causation, and Freedom," in *PSA 1970*, ed. Roger C. Buck and Robert S. Cohen, Boston Studies in the Philosophy of Science 8 (Dordrecht: D. Reidel, 1971), pp. 421-23; Chapman, *Time*, pp. 23-25.
71. Benford, *et. al.*, "Antitelephone," p. 265; cf. Fitzgerald, "Tachyons," pp. 421-23.
72. Benford, *et. al.*, "Antitelephone," p. 265.
73. Roger G. Newton, "Causality Effects of Particles That Travel Faster Than Light," *Physical Review* 162 (1967): 1274. Interestingly, Newton acknowledges his debt to Michael Scriven on the score of causal directionality and time and appeals to tachyons to show the possibility of precognition experiments. See also Paul L. Csonka, "Advanced Effects in Particle Physics, I," *Physical Review* 180 (1969): 1266-81.
74. Bilaniuk, *et. al.*, "More About Tachyons," p. 52.
75. Feinberg, "Faster-Than-Light Particles," p. 1092. Cf. Chapman, *Time*, p. 23, who asserts that after receiving a return signal which he will trigger, the observer may decide not to send his signal after all; in this case the standard objection to backward causation applies.
76. Cf. Fitzgerald, "Tachyons," pp. 428-34; idem, "Retrocausality," p. 543. Suppose, he says, I receive a tachyon message from the future that a man I am about to shoot will be at a banquet two days hence. Is it therefore not within

my power to kill him? Not at all, responds Fitzgerald; I have both ability and opportunity to do so, so that I could kill him; but were I to do so, I would not have this reliable message from the future that he is alive. The point is that ignorance is not a necessary condition of an action's being within one's power. Fitzgerald's analysis is flawed, however, when he proceeds to argue that in the case in which one does not try to perform the action precisely because he believes the tachyon message, then his freedom is limited by the message from the future. For anything, he claims, which prevents a person's doing what he wants to is a limit on his freedom. Fitzgerald fails to see, however, that in this case what one wants to do is *changed* by the message; it does not therefore prevent one from doing what he wants to do. It merely changes his motivation. As Fitzgerald goes on to observe, this can arise without messages from the future at all. Suppose before I pull the trigger someone rushes up and informs me that my intended victim is my beloved, long-lost uncle. Suddenly my motivation is changed and I no longer want to kill him; but would we say that my informer has limited my freedom in conveying his report to me?

77. Fitzgerald, "On Retrocausality," pp. 534-35.

78. Benford, *et. al.*, "Antitelephone," p. 265.

79. Earman, "Causal Propagation," p. 254. Thus, the escape route suggested by DeWitt, that information sent into the past is wiped from the observer's memory, is unavailing (Bilaniuk, *et. al.*, "Tachyons," p. 50).

80. Feinberg, "Faster-Than-Light Particles," p. 1092.

81. Fitzgerald, "Tachyons," p. 427; idem, "Retrocausality," p. 435.

82. Earman, "Causal Propagation," pp. 234-35. Assuming that the apparatus will work as it is supposed to, a typical experiment will involve the following elements: (1) a tachyon source that can be amplitude-modulated, (2) a tachyon detector, (3) a velocity filter giving a monoenergetic beam. Proposed devices for each of these are used in current tachyon research (Benford, *et. al.*, "Antitelephone," p. 263; Cf. Bilaniuk and Sudarshan, "Particles," pp. 50-51; idem, *et. al.*, "Tachyons," p.52).

83. Fitzgerald, "Tachyons," p. 428.

84. Wesley C. Salmon, *Space, Time, and Motion* (Encino, Calif.: Dickenson, 1975), pp. 119-22. This conclusion is challenged by Michael Friedman, *Foundations of Space-Time Theories* (Princeton: Princeton University Press, 1983), p. 167, who argues that infinite velocity tachyons could be used only to establish the non-conventionality of simultaneity within a single reference frame, but not absolute simultaneity between frames because an infinite velocity is not necessarily invariant among moving frames. This argument is difficult to accept, however, since an infinitely fast signal would in fact be a rigid rod dividing space into three-dimensional slices, thus furnishing absolute simultaneity. An observer in any frame moving with a finite velocity relative to the tachyon beam would still observe its speed as infinitely in excess of his, no matter how fast he was moving. Friedman's argument would, however, seem to apply against tachyons with a finite velocity $>c$. Still, the possibility of a preferential frame removes the necessity of a retro-causal account of tachyons.

85. Salmon, *Space, Time, and Motion*, p. 122. Cf. his remark: ". . . a convincing experimental demonstration of the existence of tachyons would demand severe revisions in the foundations of the special theory of relativity, perhaps even to the extent of eliminating the conventionality and relativity of simultaneity altogether" (Ibid., p. 124).

86. Bilaniuk, *et. al.*, "Tachyons," p. 52. Cf. the endorsement of their view by Adolf Grünbaum, *Philosophical Problems of Space and Time*, 2d ed., Boston Studies in the Philosophy of Science 12 (Dordrecht: D. Reidel, 1973), p. 827, who would be ready to jettison relativistic time order relations if a univer-

sal tachyonic background is introduced. For more on a preferential cosmic reference frame, see Appendix 1.

87. Whitrow, *Natural Philosophy of Time*, p. 302; cf. p. 283.
88. Ibid., p. 370.
89. Salmon, *Space, Time, and Motion*, p. 125.
90. For a helpful discussion, see Brier, *Precognition*.
91. C. D. Broad, "The Philosophical Implications of Foreknowledge," in *Knowledge and Foreknowledge*, Aristotelian Society Supplementary Volume 16 (London: Harrison & Sons, 1937), p. 178. For a collection of case studies of precognition, see H. F. Saltmarsh, *Foreknowledge* (London: G. Bell & Co., 1938).
92. Whately Carrington, "Experiments on Paranormal Cognition of Drawings," *Proceedings of the Society for Psychical Research* 46 (1940-41): 34-151; 46 (1941): 277-340; 47 (1944): 155-228.
93. S. G. Soal, "Fresh Light on Card-Guessing—Some New Effects," *Proceedings of the Society for Psychical Research* 46 (1940-41): 152-98; S. G. Soal and K. M. Goldney, "Experiments in Precognition Telepathy," *Proceedings of the Society for Psychical Research* 47 (1943): 21-150; S. G. Soal and F. Bateman, *Modern Experiments in Telepathy* (London: Faber & Faber, 1954).
94. C. D. Broad, "The Notion of Precognition," *International Journal of Parapsychology* 10 (1968): 167.
95. H. Schmidt, "Precognition of a Quantum Process," *Journal of Parapsychology* 33 (1969): 99-108.
96. E. F. Kelly and B. K. Kanthamami, "A Subject's Efforts toward Voluntary Control," *Journal of Parapsychology* 36 (1972): 185-97.
97. R. Targ and D. B. Hunt, "Learning Clairvoyance and Precognition with an ESP Teaching Machine," *Proceedings of the Parapsychological Association* 8 (1971): 9-11.
98. Bob Brier, "The Metaphysics of Precognition," in *Philosophy and Psychical Research*, ed. Shivesh C. Thakur, Muirhead Library of Philosiphy (London: George Allen & Unwin, 1976), p. 57.
99. C. W. K. Mundle, "Does the Concept of Precognition Make Sense?" *International Journal of Parapsychology* 6 (1964): 182. Similarly Mackie declares that in precognition, the precognized object is the cause of the content of the precognizer's belief (Mackie, "Direction," p. 442). According to Brier, ". . . there is nothing in our universe that prohibits a cause from succeeding its effect. Indeed, precognition may suggest that this is the case" (Brier, "Metaphysics," p. 53; cf. idem, *Precognition*, p. xi).
00. Mackie, "Direction," p. 456.
01. Mackie, *Cement*, p. 176.
02. Ibid., p. 175.
03. Mundle, "Precognition," pp. 183-87.
04. Gauld agrees with Mundle's two objections, asserting that such an explanation of precognition "would require percipients to possess, presumably unawares, powers of prediction vastly in excess of those of the most able mathematical physicists; and besides that, in the experiments of Schmidt (1969) . . . , one of the factors influencing the determination of the target was the decay of a piece of radioactive substance, a process unpredictable in the requisite detail" (Alan Gauld, "ESP and Attempts to Explain It," in *Philosophy and Psychical Research*, pp. 22-3).
05. One would not therefore seem able to explain his scores as clairvoyance or telepathic communication from the experimenter. In other cases, in which he scored +1 hits, this is not precluded, for the experimenter recorded that she dipped each hand into the bag alternately and showed a card at the aperture

with one hand even as the other hand was already delving in the bag for the next card. In the present case, one might suppose that Shackleton learned by ESP the habits of the experimenter in picking a card from one part of the bag as well as the positions of the cards in the bag. This, however, seems precluded by the fact that the experimenter reshuffled the cards before each selection by a twist of the hand and consciously avoided fixed habits of selection.

106. Mundle, "Precognition," pp. 186-87.
107. C. W. K. Mundle, "On the 'Psychic' Powers of Nonhuman Animals," in *Philosophy and Psychical Research,* p. 173. See H. Schmidt and L. Pantas, "Psi Tests with Internally Different Machines," *Journal of Parapsychology* 36 (1972): 222-32.
108. Gauld, "ESP," p. 23.
109. Mundle, "Precognition," p. 187.
110. Ibid., p. 189.
111. A. G. N. Flew, "Broad and Supernormal Precognition," in *The Philosophy of C. D. Broad,* ed. Paul A. Schilpp, Library of Living Philosophers (New York: Tudor Publishing Co., 1959), p. 430.
112. See J. J. C. Smart, ed., *Problems of Space and Time,* Problems of Philosophy Series (New York: Macmillan Co., 1964), p. 13.
113. Broad, "Foreknowledge," p. 207. (Although Broad writes as an A-theorist, the B-Theorist can make the same point.) *Contra,* see Flew, "Broad and Supernormal Precognition," p. 432. He agrees that if we infer an event at $t_2$ from an event at $t_3$, when both events are past, the event at $t_2$ is not predetermined; but that if both events are future then the inference of the event at $t_2$ from the precognized event at $t_3$ makes that event predetermined. The difference lies in the *dates*: in one case we are inferring after the event, but in the other case before the event. Unless Flew is insisting on the prefix "pre-," which I do not think he is, then I cannot see any sense in which it follows that precognition entails the predetermination of an event that would not be true of memory. Precognition does not even contribute to the event's being predeterminate, not to speak of predetermined, for the precognition is only possible on the basis of the event's being predeterminate, not *vice versa*.
114. Brier, "Metaphysics," p. 48. Cf. C. J. Ducasse, "Broad on the Relevance of Psychical Research to Philosophy," in *Philosophy of C. D. Broad,* pp. 383-84, who like Mundle appears to dispute the compatibility of a decision's being predeterminate and free on the grounds of the fallacious reasoning that what is truly precognized cannot be changed. A precognized event can be prevented *in sensu diviso,* but not *in sensu composito.*
115. Broad, "Precognition," pp. 188-90; idem, "Foreknowledge," pp. 180-87. Cf. *Encyclopedia of Philosophy,* s.v. "Precognition," by Antony Flew. Flew writes,

> "One consequence which has often been thought to follow from the existence of precognition is that, sensationally, the future must somehow be already here—or at any rate there. This is usually derived from a concept of precognition as a mode of perception, of extrasensory perception.
>     . . . it is inconceivable that anyone should be able to see things which do not yet exist. Nevertheless, the correct conclusion is not . . . that precognition is logically impossible. The correct conclusion is, rather, that if the phenomenon specified was to occur, it cannot be conceived as any sort of perception."

See also Brier, *Precognition,* p. 61; but cf. idem, "Metaphysics," p. 56, where he presupposes such a perceptual model.
116. Gauld, "ESP," pp. 27-34.
117. C. D. Broad, *Religion, Philosophy and Psychical Research* (London: Routledge & Kegan Paul, 1953), pp. 38-39.

18. Brier, *Precognition*, p. 63; cf. note 117.
19. Broad, "Precognition," pp. 186-7. Brier concludes that there is no adequate proof that precognition involves backward causation, but he stresses that its doing so cannot be ruled out because backward causation is mistakenly thought to be logically impossible (Brier, *Precognition*, p. 101).
20. This seems to me the mistake of Broad, who in his initial definition of precognition makes no reference to backward causation, but later, after presenting an objection to backward causation which he believes sound, feels compelled to add to the definition of precognition a clause ruling out an explanation in terms of backward causation. But then the precognized event, according to Broad, cannot be an effect of the precognition nor the cause of the precognition, nor can both be the effect of some third cause. But this seems to imply that the correlation between precognition and the precognized event is due merely to chance, which is also incompatible with the definition of precognition. Hence, no ostensible case of precognition can possibly be one of genuine precognition (Broad, "Precognition," pp. 193-94). Two things may be said. First, the fact that backward causation cannot be utilized to explain precognition is no justification for making that impossibility part of the definition of precognition. As Broad stated, ". . . it is no part of the *definition* of 'precognition' that the fulfilling event or state of affairs should contribute to determine the occurrence of the experience which is said to be a precognition of it" (Ibid., p. 193). One would then simply not be able to use backward causation to explain precognition. Second, Broad's alternatives are not exhaustive: on the two models suggested in the text the correlation between precognition and event is due neither to chance nor to any causal connection between them nor to a third cause. The subject simply knows or is informed what is going to happen independently of the occurrence of the event itself.
21. See the stimulating piece by Gauld, "ESP," pp. 34-42. He, taking his inspiration from C. J. Jung, defends what I have called a Platonic recollection model of precognition. Jung had posited the existence of archetypes in the subconscious which are in some sense trans-temporal and trans-spatial and therefore harbor knowledge of spatially or temporally distant events of which the conscious mind has no inkling. Though Gauld rejects the theory of archetypes, he nevertheless finds in Jung's thesis "one curious and interesting central idea" independent of the archetypes (Ibid., p. 36). That is the idea that extrasensory perception, including precognition, does not occur at all; rather the mind possesses innately such knowledge on a subconscious level, which on occasion surfaces in consciousness. Gauld explains,

> "The term ESP is a complete misnomer. We do not acquire the factual knowledge exhibited in so-called ESP by any quasi-perceptual or transmissive process, though sometimes we may fancy we do because of the form in which it manifests. The knowledge concerned is, from the point of view of our everyday notions of how we acquire factual information, totally anomalous. The knowledge is not 'acquired,' the information does not 'arrive'. The knowledge, so to speak, 'happens'. 'However incomprehensible it may appear,' writes Jung, 'we are finally compelled to assume that there is in the unconscious something like an *apriori* knowledge or immediate presence of events which lacks any causal basis.' ([C. J. Jung, *Synchronicity* (London: Routledge & Kegan Paul, 1920,] pp. 43-4)" (Ibid., p. 36).

The point I am trying to make is not that Gauld's hypothesis is more or even as plausible as backward causation as an explanation of precognition, but merely that, contrary to widespread impression, genuine precognition in no way entails backward causation. On Gauld's model, "We could stop worrying

in connection with precognition about the problem of 'future causes' and all that goes with it" (Ibid., p. 37).

122. Larry Dwyer, "How to Affect, but not Change, the Past," *Southern Journal of Philosophy* 15 (1977): 383.

123. A point made against Dwyer by Lynne Spellman, "Causing Yesterday's Effects," *Canadian Journal of Philosophy* 12 (1982): 153.

124. See Monte Cook, "Tips for Time Travel," in *Philosophers Look at Science Fiction*, ed. Nicholas D. Smith (Chicago: Nelson-Hall, 1982), pp. 47-55.

125. See D. C. Williams, "The Myth of Passage," *Journal of Philosophy* 48 (1951): 463.

126. Kurt Gödel, "A Remark about the Relationship between Relativity Theory and Idealistic Philosophy," in *Albert Einstein: Philosopher-Scientist*, 2 vols., ed. Paul Arthur Schilpp (rep. ed.: New York: Harper and Brothers; Harper Torchbooks, 1959), pp. 557-62. Gödel also announced discovery of expansion models and models with any value for Λ for which there exists no cosmic time because of the presence of cosmic rotation. For an interesting diagram of Gödel's spacetime, see Horwich, *Asymmetries*, p. 113. For a thorough discussion of such models, see Andreas Bartels, *Kausalitätsverletzungen in allgemeinrelativistischen Raumzeiten*, Erfahrung und Denken 68 (Berlin: Duncker & Humboldt, 1986).

127. The difference is not always appreciated. But, for example, various Euclidean and non-Euclidean geometries are nomologically possible for spacetime, but given that one holds, certain things become physically impossible though they are nomologically possible, *e.g.* in an open universe returning to a point of origin by traveling along a line.

128. Whitrow, *Natural Philosophy of Time*, p. 307.

129. Gödel, "Remark," p. 561.

130. David Lewis, "The Paradoxes of Time Travel," *American Philosophical Quarterly* 13 (1976): 151. Cf. Gorowitz's example of shooting oneself in the past (Gorowitz, "Past," pp. 360-71). Interestingly enough, if our argument here is correct, while it is impossible that the later self kill the earlier self, it could well be the case that the earlier self unwittingly kill the later self while he was on a journey in the past. The earlier self would continue to live on until he made his fatal trip into the past, to die at his own hand.

131. See Paul Horwich, "On Some Alleged Paradoxes of Time Travel," *Journal of Philosophy* 72 (1975): 435.

132. Larry Dwyer, "Time Travel and Changing the Past," *Philosophical Studies* 27 (1975): 348; see also Brier, *Precognition*, pp. 46-47. Horwich concludes that the impossibility of what he calls autoinfanticide has nothing to do with time travel (Horwich, *Asymmetries*, p. 119).

133. Horwich, "Paradoxes," p. 437.

134. Earman, "Causal Propagation," pp. 230-32.

135. Ibid., p. 232.

136. Horwich, "Paradoxes," p. 440; and more recently Horwich, *Asymmetries*, pp. 119-28. I am indebted to William Hasker for many interesting discussions on this issue.

137. Horwich, *Asymmetries*, pp. 119-28.

138. Ibid., p. 126.

139. See pp. 88-90. These same considerations serve to undermine the so-called "power entailment principles" proposed by William Hasker, "Foreknowledge and Necessity," *Faith and Philosophy* 2 (1985): 142-44; idem, "A Refutation of Middle Knowledge," *Noûs* 20 (1986): 553-54. The falsity of these principles is pointed out by David Basinger, "Middle Knowledge and Human Freedom: Some Clarifications," *Faith and Philosophy* 4 (1987): 330-36, though he in fact

proposes no alternatives, as Hasker correctly argues in "Reply to Basinger on Power Entailment," *Faith and Philosophy* 5 (1988): 87-90. Like Fischer's "Fixed Past Principles," these principles are in the end arbitrary assumptions to which divine foreknowledge may be taken as a counter-example. It seems to me that it does lie within our power to determine God's past beliefs, as well as, and, in fact, *through* the antecedent truth of future contingent propositions; but this is by no means incumbent upon the non-fatalist, who may prefer simply to hold that it is within our power to do certain acts and if we were to do them, God's past beliefs would have been different.

40. Perhaps the most startling example of such circular causation concerns the time-traveler who journeys back in time and marries his mother, thus begetting himself; then having done so, he goes back still further in time, has a sex change operation, and later marries himself, so that he turns out to be not only his own father, but his own mother as well! (See Robert Heinlein, "All You Zombies," in *The B.st from Fantasy and Science Fiction*, ed. R. P. Mills [New York: Ace Books, 1958].)

41. Lewis, "Paradoxes," p. 149.

42. God's being uncaused is not inexplicable if we take the causal principle to be that whatever begins to exist has a cause. Since God is eternal, He needs no cause. Since the universe began to exist, the Big Bang does require a cause. As for the motion of subatomic particles, these are inexplicable only if every event must have a cause, and I am not certain of this. Lewis seems to presuppose that the causal principle is that everything must have a cause and, seeing that the information in the time loop has no cause, appeals to other instances of uncaused things to justify its existence here. But the problem is not that the information is uncaused, for it is not, but that it is caused circularly. This sort of causation seems unintelligible in a way that his three examples do not.

43. See Anglin, "Backwards Causation," p. 90, for some stimulating suggestions.

44. A point rightly discerned by Spellman, "Yesterday's Effects," pp. 157-60; idem, "Forthcoming Sea Fights: What Theory of Time?" *New Scholasticism* 55 (1981): 52-68.

45. Graham Nerlich, "How to Make Things Have Happened," *Canadian Journal of Philosophy* 9 (1979): 2, 21.

46. O. Costa de Beauregard, "CPT Invariance as Basic for Interpreting Quantum Mechanics," in *Old and New Questions in Physics, Cosmology, Philosophy, and Theoretical Biology*, ed. Alwyn van der Merwe (New York: Plenum Press, 1983), pp. 90-91.

47. Earman, "Causation," pp. 6, 21-22. Grünbaum is of course equally committed to the B-theory, but has a stake in denying backward causation because he relies upon causation to explain time's arrow.

48. Brier, "Metaphysics," p. 56.

49. Dwyer, "Time Travel," pp. 17, 29. Again, he argues that anyone who defends the possibility of time travel will be inclined to reject any ontological differences between the past and the future. "Since the time traveler, from any event $x$ can effect events both in the chronological past lobe and chronological future lobe of $x$, there would seem to be no good ground for making distinctions in ontological status between the events which lie in each lobe" (Ibid., p. 36). Contrast Williams, "Myth of Passage," pp. 458-62, who erroneously appears to think of the A-theory as though time were stretched out like a line, with us either moving along it or it moving past us. Such a view is Williams's own hybrid conconction of A- and B-theories.

50. Lewis, "Paradoxes," p. 146. Cf. Gödel, "Remarks," p. 557, who thought that Minkowski spacetime validates the view of Parmenides, Kant, and the

idealists that change is illusory or an appearance due to our special mode of perception.

151. Horwich, *Asymmetries*, pp. 20, 37.
152. The B-theory is not therefore a sufficient condition for backward causation, for some atemporal series, *e.g.* the number series 1, 2, 3, . . . , is ordered in a direction despite the equal reality of each member. The B-theory rather seems to be a necessary condition of backward causation.
153. As Whitrow puts it, "A distinction can be drawn between those states that have been present (and are now past) and those that have not so far been present (and are now future). The former are those of which, in principle, enduring traces of their occurrence could have been recorded when they occurred and can also be co-present with the present state" (Whitrow, *Natural Philosophy of Time*, p. 372).
154. Sarah Waterlow, "Backward Causation and Continuing," *Mind* 83 (1974): 372-87. This is ironically virtually the same consideration originally urged by Dummett against backward causation. He argued that a remote cause is the immediate cause of a process which is in turn the immediate cause of the effect. Since a process cannot continue backward in time, an effect cannot precede its remote cause (Dummett, "Effect Precede its Cause," pp. 27-31). The association of causality with a particular temporal direction has a genuine basis in the way things happen; there is an objective asymmetry in nature (Dummett, "Bringing about the Past," p. 338). In the heated controversy which ensued, his original contention was completely overlooked. Thus Anthony Kenny's objection that on Dummett's view there is no clear distinction between the past and future is groundless (Kenny, *God of the Philosophers*, pp. 107-9). Kenny presupposes a B-theory of time and then finds himself at a loss to account for temporal directionality once backward causation is assumed. But this furnishes no sufficient reason to reject backward causation; rather it calls into question the causal theory of time. On Dummett's A-theory, the arrow of time is independent of causal directionality. And it is not the case, as Kenny alleges, that on Dummett's account of backward causation portions of the past remain to be written; rather they are written, but by causes which, at the time their writing, did not in any sense exist—and therein lies the absurdity.
155. Whitrow, *Natural Philosophy of Time*, p. 372.
156. Broad, "Foreknowledge," pp. 190-200; idem, "Precognition," pp. 190-93; Mundle, "Precognition," pp. 187-89.
157. We have direct acquaintance with the traces of the perceived event; but there are no traces of future events. Therefore, if the causal objection is sound, Broad's objection to the second assumption fails.
158. Broad, "Precognition," p. 190.
159. Brier, *Precognition*, pp. 68-69.
160. Brier, "Metaphysics," p. 56.

## NOTES TO CHAPTER SEVEN

1. Richard Taylor, "I Can," *Philosophical Review* 69 (1960): 78-89.
2. Richard Taylor, "Fatalism," *Philosophical Review* 71 (1962): 62.
3. For a critique of Taylor's position see John Turk Saunders, "Fatalism and Ordinary Language," *Journal of Philosophy* 62 (1965): 211-22.
4. Nelson Pike, "Divine Omniscience and Voluntary Action," *Philosophical Review* 74 (1965): 33.
5. Ibid., pp. 38-40.
6. John Turk Saunders, "Of God and Freedom," *Philosophical Review* 75 (1966): 221.

7. Nelson Pike, "Of God and Freedom: a Rejoinder," *Philosophical Review* 75 (1966): 377.

## NOTES TO CHAPTER EIGHT

1. Arthur Prior, *Past, Present, and Future* (Oxford: Clarendon Press, 1957), pp. 115-16; idem, "The Formalities of Omniscience," in idem, *Papers on Time and Tense* (Oxford: Clarendon Press, 1968), p. 32. For a critique of this claim, see James Tomberlin, "Prior on Time and Tense," *Review of Metaphysics* 24 (1970-1): 71-2; idem, "The Sea Battle Tomorrow and Fatalism," *Philosophy and Phenomenological Research* 31 (1970-71): 352-7. Unfortunately, Tomberlin does not seem to understand that Prior is arguing, not that the antecedent is logically necessary, but that it is temporally necessary. Still one can agree with Tomberlin's final verdict that if the necessity at issue is not logical, then one cannot see how the argument for fatalism can be cogent.
2. A. N. Prior, *Formal Logic* (Oxford: Clarendon Press, 1955), p. 241.
3. Prior, "Formalities," p. 38.
4. A. N. Prior, "Contemplation and Action," in *Time and Tense*, p. 49.
5. Prior, *Formal Logic*, p. 241.
6. A Prior-esque response is given to Ockham by Joshua Hoffman and Gary Rosenkrantz, "On Divine Foreknowledge and Human Freedom," *Philosophical Studies* 37 (1980): 289-96. They reject Ockham's solution because there are no possible circumstances in which it is within one's power to change the past. For if one refrains, then God's foreknowledge would have been different. Thus, the past was not changed. Thus, they conclude, Ockham's solution fails. In their critique of the Boethian-Thomistic solution, they go on to deny that it is within one's power to bring it about that God would have known otherwise. Obviously Rosenkrantz and Hoffman are very muddled here. Ockham's solution did not involve changing the past, but the counterfactual dependence of God's past foreknowledge on some future event, such that were the event not to occur God would have always foreknown other than He in fact does. Their later denial of this counterfactual dependence is unsupported and contradicts their espousal of the same in their critique of Ockham's supposed view. For a reply to Hoffman and Rosenkrantz, see William L. Rowe, "On Divine Foreknowledge and Human Freedom: a Reply," *Philosophical Studies* 37 (1980): 429-30.
7. Nelson Pike, "Divine Omniscience and Voluntary Action," *Philosophical Review* 74 (1965): 33.
8. Ibid., pp. 37-8.
9. Ibid., pp. 31-32; idem, *God and Timelessness*, Studies in Ethics and the Philosophy of Religion (London: Routledge & Kegan Paul, 1970), p. 59. Cf. the defense of fatalism by William Hasker, "Foreknowledge and Necessity" *Faith and Philosophy* 2 (1985):121-57, who also construes the counterfactual dependence of God's foreknowledge on our actions in terms of our ability to alter the past. But as Reichenbach points out, God's beliefs about the future are not "future indifferent," but would be different if time ended now. Our ability to bring about God's past beliefs does not entail the power to alter His past beliefs (Bruce Reichenbach, "Hasker on Omniscience," *Faith and Philosophy* 4 [1987]: 86-92). Reichenbach's discussion of time travel is, however, erroneous: both the time traveler and the persons he observes can act differently than how the time traveler knows they shall, since the moment of observation is for them both the present, so that their actions are not temporally necessary. In his "The Hardness of the Past: A Reply to Reichenbach," *Faith and Philosophy* 4 (1987): 337-42, Hasker objects that if $x$ did not occur at $t_1$, then one

does not have the power to bring it about that $x$ occurred at $t_1$. But notice
the absence of the subjunctive mood: what the non-fatalist maintains is the
power to bring it about that $x$ would have occurred. Hence, Hasker errs in
asserting, ". . . it is the power to bring about something in the past which
did *not* occur—that is, it must be the power to alter the past" (Ibid., p. 340).
In fact, Hasker's error is the same as Taylor's: construing necessity *in sensu
composito* as a limitation on personal power.

10. Pike, "Omniscience," p. 33; idem, *God and Timelessness*, p. 59. Cf. J. R.
    Lucas, *The Freedom of the Will* (Oxford: Clarendon Press, 1970), pp. 68-
    76, who lauds Pike's "admirable discussion" of the necessity of God's past
    knowledge. According to Lucas, because God's knowledge is definite, it cannot
    depend on what is yet to happen. He gives no justification for this *non sequitur*.
    See also Richard L. Purtill, "Foreknowledge and Fatalism," *Religious Studies*
    10 (1974): 319-24, who agrees with Lucas that if God predicted infallibly what
    I shall do tomorrow, then my actions tomorrow are unchangeable. He thereby
    commits Pike's fallacy, for the future and the past alike are unalterable, but
    this does not threaten freedom or contingency. Purtill also reiterates that past
    knowledge cannot depend on future events, but gives no justification for this
    assertion. Fourteen years later, Purtill continues to make the same mistakes,
    speaking of the impossibility of altering the past and asserting that "soft facts"
    about the past are facts which can be changed, so that the set of propositions
    true at some past time $t$ must be either changing or growing (Richard L.
    Purtill, "Fatalism and the Omnitemporality of Truth," *Faith and Philosophy*
    5 (1988): 186-87). For a critique of Lucas's view that God voluntarily limits
    His omniscience, see Anthony Kenny, *The God of the Philosophers* (Oxford:
    Clarendon Press, 1979), pp. 60-1.
11. Pike, *God and Timelessness*, p. 73.
12. Alvin Plantinga, *God, Freedom, and Evil* (New York: Harper & Row; Harper
    Torchbooks, 1974), pp. 66-72.
13. Pike, "Omniscience," pp. 38-40.
14. Ibid., p. 41. (Pike's italics.) See also Nelson Pike, "Fischer on Freedom and
    Foreknowledge," *Philosophical Review* 93 (1984): 603, 606.
15. Pike, "Omniscience," p. 42. (Pike's italics.)
16. Ibid., p. 44.
17. Pike, *God and Timelessness*, p. 79.
18. Pike, "Omniscience," p. 42; idem, "Fischer on Foreknowledge," pp. 611-12.
19. Pike, "Omniscience," p. 45; cf. idem, *God and Timelessness*, p. 80.
20. Pike, "Omniscience," p. 46; idem, "Fischer on Foreknowledge," p. 611.
21. See Stephen T. Davis, "Divine Omniscience and Human Freedom," *Religious
    Studies* 15 (1979): 308, 311; idem, *Logic and the Concept of God* (Grand
    Rapids, Mich.: Wm. B. Eerdmans, 1983), pp. 58-61. Failing to see the point
    is John Martin Fischer, "Freedom and Foreknowledge," *Philosophical Review*
    92 (1983): 69. Pike admits that if his reasoning would also prove that human
    foreknowledge implies fatalism, then he would regard this as the *reductio ad
    absurdum* of his argument (Pike, "Fischer on Foreknowledge," p. 607).
22. John Turk Saunders, "Of God and Freedom," *Philosophical Review* 75 (1966):
    219-25.
23. Ibid., p. 221. Cf. idem, "The Temptations of Powerlessness," *American
    Philosophical Quarterly* 5 (1968): 104. Siding with Saunders is Robert Young,
    *Freedom, Responsibility and God*, Library of Philosophy and Religion (New
    York: Barnes & Noble, 1975), pp. 36-7.
24. Nelson Pike, "Of God and Freedom: a Rejoinder," *Philosophical Review* 75
    (1966): 364-79.
25. Ibid., p. 377.

26. Nelson Pike, "Divine Foreknowledge, Human Freedom, and Possible Worlds," *Philosophical Review* 86 (1977): 209-16.
27. As Hoffman points out, Plantinga is not giving an analysis of "within one's power" in terms of possible worlds, but using possible world semantics to enable us to more clearly see the counterfactual nature of claims like (8) (Joshua Hoffman, "Pike on Possible Worlds, Divine Foreknowledge, and Human Freedom," *Philosophical Review* 88 [1979]: 436). Plantinga himself is dubious that possible world semantics will be of any help in finding a useful account of "within one's power" (Alvin Plantinga, "Ockham's Way Out," *Faith and Philosophy* 3 (1986): 265).
28. Pike, "Foreknowledge and Possible Worlds," p. 215.
29. Ibid., p. 216. Agreeing with Pike against Plantinga is Runzo, "Omniscience," p. 143.
30. Hoffman, "Pike on Possible Worlds," pp. 437-42; so also Plantinga, "Ockham's Way Out," pp. 263-64.
31. William J. Wainwright, *Philosophy of Religion: an Annotated Bibliography of Twentieth Century Writings in English* (New York: Garland Publishing, 1978), pp. 104-5; so also Hoffman, "Pike on Possible Worlds," p. 441; Plantinga, "Ockham's Way Out," pp. 263-64. Plantinga asserts that if it is even true that Jones will do $x$ at $t$ or that Jones has the property of doing $x$ at $t$, then these facts must also characterize the other worlds in question, so that Pike's criterion leads to logical fatalism.
32. Davis, "Omniscience," p. 309.
33. Fischer, "Freedom and Foreknowledge," pp. 11-72; Pike, "Fischer on Foreknowledge," pp. 599-614 serves mainly to reiterate Pike's earlier arguments.
34. John Fischer, "Power Over the Past," *Pacific Philosophical Quarterly* 65 (1984): 335-50.
35. Like Prior and Pike, Helm also construes the necessity of the past in terms of its unalterability (Paul Helm, "Divine Foreknowledge and Facts," *Canadian Journal of Philosophy* 4 [1974]: 307, 310; idem, "Fatalism Once More," *Philosophical Quarterly* 25 [1975]: 355). In one place, he appears to present a different argument for the necessity of foreknowledge, contending that one cannot do anything after the proposition "God truly believes that $p$" is true to make God know that $p$ (Idem, "Freknowledge and Facts," p. 308). But he interprets the argument only in terms of the impossibility of *changing* God's belief (Ibid., p. 313. This same fallacy underlies the critique of Helm by Dennis C. Holt, "Foreknowledge and the Necessity of the Past," *Canadian Journal of Philosophy* 6 [1976]: 726). If it is not so interpreted, there seems nothing objectionable about holding that a future-tense proposition is antecedently true in virtue of one's future act and that God, being omniscient, knows the truth of this proposition from eternity. (Cf. Alfred J. Freddoso, "Accidental Necessity and Power over the Past," *Pacific Philosophical Quarterly* 63 [1982]: 66-7.)
    As for Iseminger, his argument is mainly of interest because of the perceptive replies of Langerak and Mavrodes, who both observe that the necessity operative in the argument is mere unalterability and that one's powerless is only the inability to make a logical contradiction true (George Mavrodes, "Aristotelian Necessity and Freedom," *Midwest Studies in Philosophy* 1 [1976]: 18-19; Edward Langerak, "Of Foreknowledge and Necessity," *Midwest Studies in Philosophy* 1 [1976]: 14). Boothe's contribution to the argument will be taken up in the next chapter.

NOTES TO CHAPTER NINE

1. William Lane Craig, "Temporal Necessity, Hard Facts/Soft Facts," *International Journal for Philosophy of Religion* 20 (1986): 65-91.
2. John Turk Saunders, "Of God and Freedom," *Philosophical Review* 75 (1966): 219-25; see also idem, "Fatalism and Ordinary Language," *Journal of Philosophy* 62 (1965): 215-16; idem, "The Temptations of Powerlessness," *American Philosophical Quarterly* 5 (1968): 104-7.
3. Nelson Pike, "Of God and Freedom: A Rejoinder," *Philosophical Review* 75 (1966): 370.
4. Marilyn McCord Adams, "Is the Existence of God a 'Hard' Fact?" *Philosophical Review* 76 (1967): 492-503. In his *God and Timelessness* Pike acknowledges his intellectual indebtedness to his students Marilyn and Robert Adams.
5. Ibid., p. 499.
6. Paul Helm, "Divine Foreknowledge and Facts," *Canadian Journal of Philosophy* 4 (1974): 313.
7. Cf. Stephen Richard Boothe, "Temporal Necessity and Divine Foreknowledge," (Ph.D. dissertation, University of California at Irvine, 1978), pp. 34-40. He argues that any past-tense sentence entails a future-perfect tense version of the same sentence, and hence no fact is hard. This is mistaken, however, for this assumes there will be a future, whereas there could conceivably be no times after the present moment (*e.g.*, the world could be annihilated by God). The same oversight is made by C. J. F. Williams, "True Tomorrow, Never True Today," *Philosophical Quarterly* 28 (1978): 291; Alvin Plantinga, "Ockham's Way Out," *Faith and Philosophy* 3 (1986): 251.
8. Boothe, "Temporal Necessity," p. 40.
9. John Martin Fischer, "Freedom and Foreknowledge," *Philosophical Review* 92 (1983): 75; also Plantinga, "Ockham's Way Out," p. 252.
10. Fischer, "Freedom and Foreknowledge," pp. 76-9.
11. Ibid., p. 76.
12. John Martin Fischer, "Hard-Type Soft Facts," *Philosophical Review* 95 (1986): 591-601.
13. Ibid., p. 595. Fischer does not seem to notice that his account here makes fixity person-relative, such that a past event may be fixed for some persons but not for other, more powerful persons, which seems not at all to capture our intuitions concerning the fixity of the past. Fixity ought not to be defined in terms of the power of agents at all, but in terms of whether some future event is the explanatory condition of a past or present reality. Where this is not the case, the past or present fact is fixed. Whether we can do anything to affect an unfixed fact will be a matter of what lies "within one's power" and will vary on a case to case basis.
14. Ibid., p. 598.
15. Ibid., p. 600; cf. a similar admission in idem, "Power over the Past," *Pacific Philosophical Quarterly* 65 (1984): 348.
16. Fischer, "Hard-Type Soft Facts," p. 600.
17. See my "Nice Soft Facts: Fischer on Foreknowledge," *Religious Studies* 25 (1989): 235-46.
18. Alfred J. Freddoso, "Accidental Necessity and Logical Determinism," *Journal of Philosophy* 80 (1983): 257-8.
19. Ibid., pp. 259-60; idem, "Accidental Necessity and Power over the Past," *Pacific Philosophical Quarterly* 63 (1982): 57-8.
20. Freddoso, "Logical Determinism," p. 276.
21. Ibid., p. 264.
22. Ibid., p. 266.
23. Ibid., p. 268.

24. Thomas P. Flint and Alfred J. Freddoso, "Maximal Power," in *The Existence and Nature of God*, ed. A. J. Freddoso (Notre Dame, Ind.: Notre Dame University Press, 1983), pp. 93, 104-7.
25. Freddoso, "Logical Determinism," p. 275.
26. See the brief critique, apparently added as an afterthought, to E. M. Zemach and D. Widerker, "Facts, Freedom, and Foreknowledge," *Religious Studies* 23 (1987): 24. They allege that no proposition is immediate because the truth of any proposition depends on the truth of propositions prior to that instant, *e.g.*, "David is sitting" would not be true at $t$ if while falling David happened to assume a sitting position at $t$. Or again, it is "absurd" to require propositions whose truth conditions depend on future and past states to be a truth function of elementary propositions, some of which are immediate, for even the immediacy of these elementary propositions is dubious, *e.g.*, "$x$ is made of wood." But this critique is misconceived. Their counter-examples can obviously be true at a last or intermediate moment of time; and if God creates the world *ex nihilo* with the appearance of age, the first moment could be one in which David is sitting or $x$ is made of wood.

On their own account, a true proposition $p$ of the form $p$-at-$t_n < t$ expresses a soft fact at $(w, t)$ iff $p$ is false in some other world sharing the same past at $t$ as $w$ (where the past is the set of true propositions compatible with $t$ being the last moment of time in a world having the same ontology as $w$). The requirement of identical ontology is a mistake, as we shall see.

27. Freddoso, "Logical Determinism," p. 260; idem, "Maximal Power," pp. 89-90.
28. Ibid.; ibid., p. 90.
29. Therefore I cannot understand why in "Maximal Power," p. 90, Freddoso takes his account to be compatible with backward causation.
30. Plantinga, "Ockham's Way Out," p. 253.
31. I see a similar problem in the definitions of hard and soft facts offered by Joshua Hoffman and Gary Rosenkrantz, "Hard and Soft Facts," *Philosophical Review* 93 (1984): 419-34. Distinguishing between eternal states of affairs (*e.g.*, *Socrates is walking at* $t_n$) and unrestrictedly repeatable, present-tense or tenseless states of affairs (*e.g.*, *Socrates is walking*), they offer the following definition of a hard fact:

   (i) $r$ is the state of affairs: $s$ at $t$;
   (ii) $s$ is an unrestrictedly repeatable, present-tense state of affairs;
   (iii) $s$ obtains throughout $t$;
  (iv) either $s$ is a simple state of affairs or, if it is complex, all its parts are unrestrictedly repeatable, present-tense states of affairs;
   (v) neither $r$ nor $s$ nor any of $s$'s parts entails either a simple unrestrictedly repeatable, present-tense state of affairs indexed to a time which does not overlap with $t$, or a complex unrestrictedly repeatable, present-tense state of affairs all of whose parts are unrestrictedly repeatable, present-tense states of affairs and which is indexed to a time which does not overlap with $t$;
  (vi) $t$ is a past time.

On this definition, the state of affairs *At* $t_1$ *God knows that Jones walks at* $t_2$, where $t_1 < t_2$, is a soft fact because it does not satisfy (ii) or (v). For $r = At$ $t_1$ *God knows p*, and $s = God$ *knows p*; and $s$ is eternal, not unrestrictedly repeatable, since God is a necessary being. Moreover, $r$ entails $p$ which is indexed to $t_2$. By contrast, a fact like *Socrates walks* meets all conditions for hardness.

Unfortunately, the above definition seems very contrived and arbitrary; Hoffman and Rosenkrantz offer no justification for thinking a hard fact must satisfy these criteria, and I can see nothing about this definition which captures

one's intuitions of hardness and softness with regard to past facts. They have broken the hard/soft distinction away from the notion of temporal necessity which it was supposed to express. For, they confess, their hard/soft distinction is not the same as the distinction between facts within/beyond one's power. (Interpreting the distinction in terms of the power of agents is Plantinga's suggestion, which I criticize in the text.) For on their definition necessary states of affairs, *e.g.*, *God exists at $t_n$*, are all soft facts, since they fail to satisfy (ii)! Similarly, all past-tense statements, *e.g.*, *Columbus walked in 1492*, express soft facts, since they also fail to satisfy (ii), though the present tense version *Columbus walks in 1492* is hard! On the difference between these two versions, Hoffman and Rosenkrantz reply, "Our approach here is nominally to deny hard fact status to the past tense fact so that a cogent analysis of the hard fact/soft fact distinction can be formulated" (Ibid., p. 433). The most that can be said for their definition is that all hard facts turn out to be beyond one's power. But it seems clear that they have constructed an artificial distinction between hard and soft facts which fails to elucidate the true nature of temporal necessity. It is therefore of little help in solving the question of theological fatalism, for the fatalist could point out that on this definition all sorts of facts beyond one's power are declared to be "soft."

32. He further revises this definition such that $A$ must be a basic action for $S$, that is, $S$ must be able to perform $A$ without having to perform some other action in order to perform $A$. Thus, the action cannot be, say, acting such that some past event would not have occurred. Then Plantinga adjusts the definition to allow for a plurality of agents $S$.

33. David Lewis, "Counterfactual Dependence and Time's Arrow," *Noûs* 13 (1979): 455-62; cf. Wayne Davis, "Indicative and Subjunctive Conditionals," *Philosophical Review* 88 (1979): 553-5. *Nota Bene* Falk's remark that "The so-called necessity of the past is the 'standard' resolution of nearness conditionals in the disguise of a straightforward modality . . . . Such a procedure leads directly to fatalism" (Arthur E. Falk, "Ifs and Newcombs," *Canadian Journal of Philosophy* 15 [1985]: 480).

34. But see Jonathan Bennett, "Counterfactuals and Temporal Direction," *Philosophical Review* 93 (1984): 57-91, who argues that the usual arguments against backward counterfactuals employ an arbitrary double standard and that no special resolution of vagueness need be employed in backward counterfactuals.

35. Plantinga, "Ockham's Way Out," p. 258.

36. For a theory of temporal necessity construed in causal terms, see Thomas Bradley Talbott, "Fatalism and the Timelessness of Truth," (Ph.D. dissertation, University of California, Santa Barbara, 1974), pp. 99-137. Talbott's account is inadequate as it fails to reckon with cases of non-causal counterfactual dependence of past actualities on future ones. In a later paper (Thomas Talbott, "On Divine Foreknowledge and Bringing about the Past," paper presented at Western Division Meeting of the American Philosophical Association, Chicago, Illinois, April 30, 1983), he seems to have discerned the distinction between back-tracking counterfactual dependence and retro-causation; cf. Thomas B. Talbott, "On Divine Foreknowledge and Bringing about the Past," *Philosophy and Phenomenological Research* 46 (1986): 455-69. In his later paper, Talbott abandoned his causal theory for an account of temporal necessity in terms of the power of agents which anticipates Plantinga's account.

37. See Ludovici Molina *Liberi arbitrii cum gratiae donis, divina praescientia, providentia, praedestinatione et reprobatione concordia* 4. 51. 18; 4. 52. 32. Part IV of this work has been translated as *On Divine Foreknowledge* by Alfred J. Freddoso ((Ithaca, N.Y.: Cornell University Press, 1988). What is odd about Molina's doctrine is that he also held that in virtue of God's

middle knowledge, God's past beliefs, though now temporally necessary, would have been different were some future contingent event to go differently. But opponents of fatalism have generally not meant anything more in calling some past fact temporally contingent than precisely that. Molina was exercised to deny that any agent, including God, now has the power to bring it about that an event which has happened has never happened. But his arguments seem to be directed against a retro-causal construal of such a claim. In any case, opponents of fatalism have generally not made such a claim; they hold only that agents have the power to act in such a way that, if they were to so act, then an event which has happened would never have happened.

38. Alfred J. Freddoso, "Introduction," to *On Divine Foreknowledge*, p. 58.
39. See discussion in my *The Problem of Divine Foreknowledge and Future Contingents from Aristotle to Suarez*, Brill's Studies in Intellectual History 7 (Leiden: E.J. Brill, 1988), pp. 186-87.
40. Freddoso, "Introduction," p. 59. Actually (12*) does not preclude retrocausal contribution to *p*'s being true, but then the cause of *p* would likewise have to be temporally necessary. Otherwise, one could act to prevent the cause and, since it is causally linked to *p*, thereby causally contribute to *p*'s not being true. The problem is that no metaphysically contingent future state of affairs can be temporally necessary, since either God or, in the case of counterfactuals of creaturely freedom, creatures have the power to contribute causally to such states not being true. Hence, all retro-causation is impossible.
41. Freddoso, "Introduction," p. 61.
42. Ibid.
43. See discussion in Craig, *Foreknowledge and Contingents from Aristotle to Suarez*, pp. 189, 191-92.
44. George I. Mavrodes, "Vestigial Modalities," *Analysis* 43 (1983): 91-4.
45. Mavrodes makes the application explicit in George Mavrodes, "Is the Past Unpreventable?" *Faith and Philosophy* 1 (1984): 131-46.
46. William Hasker, "Modalities—Vestigial and Circumstantial," paper presented at the Western Division Meeting of the American Philosophical Association, April 26-28, 1984.
47. George Mavrodes, "Comment on William Hasker's 'Modalities—Vestigial and Circumstantial'," paper presented at the Western Division Meeting of the American Philosophical Association, April 26-28, 1984; Mavrodes, "Unpreventable?" pp. 140-4.
48. William Hasker, "Handout for Modalities—Vestigial and Circumstantial," paper presented at the Western Division Meeting of the American Philosophical Association, April 26-28, 1984.
49. See further Mavrodes, "Unpreventable?" pp. 136-7.

## NOTES TO CHAPTER TEN

1. Isaac Levi, "A Note on Newcombmania," *Journal of Philosophy* 79 (1982): 337-42. Further indication of the philosophical interest in this puzzle is the very fine anthology edited by Richmond Campbell and Lanning Sowden, *Paradoxes of Rationality and Cooperation: Prisoner's Dilemma and Newcomb's Problem* (Vancouver: University of British Columbia Press, 1985). See especially their comprehensive bibliography.
2. Robert Nozick, "Newcomb's Problem and Two Principles of Choice," in *Essays in Honor of Carl G. Hempel*, ed. Nicholas Rescher. Synthese Library (Dordrecht, Holland: D. Reidel, 1969), p. 115.
3. Ibid., p. 116.

4. Robert Nozick, cited in Martin Gardiner, "Mathematical Games," *Scientific American*, March 1974, p. 102.

5. Maya Bar-Hillel and Avishai Margalit, "Newcomb's Paradox Revisited," *British Journal for the Philosophy of Science* 23 (1972): 301.

6. Don Locke, "How to Make a Newcomb Choice," *Analysis* 38 (1978): 21.

7. Ibid., p. 23. Cf. Don Locke, "Causation, Compatibilism and Newcomb's Paradox," *Analysis* 39 (1979): 210-11.

8. George Schlesinger, *Aspects of Time* (Indianapolis: Hackett, 1980), pp. 79, 144.

9. Isaac Asimov, cited in Gardiner, "Games," p. 104.

10. Dennis M. Ahern, "Foreknowledge: Nelson Pike and Newcomb's Problem," *Religious Studies* 75 (1979): 489.

11. James Cargile, "Newcomb's Paradox," *British Journal for the Philosophy of Science* 26 (1975): 235-6; Doris Olin, "Newcomb's Problem: Further Investigations," *American Philosophical Quarterly* 13 (1976): 130-1; Bar-Hillel and Margalit, "Newcomb's Paradox," p. 297.

12. Cf. Alan Gibbard and William L. Harper, "Counterfactuals and Two Kinds of Expected Utility," in *Foundations and Applications of Decision Theory*, ed. C. A. Hooker, J. J. Leach, and E. F. McClennen, 2 vols., vol. 1: *Theoretical Foundations*, The University of Western Ontario Series in Philosophy of Science 13 (Dordrecht, Holland: D. Reidel, 1978), pp. 129-52. They imagine the case of Solomon, who learns that charismatic kings are not prone to revolts of the people, whereas uncharismatic kings are. Moreover, being charismatic or not is purely genetic. Gibbard and Harper contend that it would be irrational for Solomon to refrain from adultery on the grounds that this would be evidence that he is uncharismatic, even though he would welcome the news that he is about to refrain because that would be evidence that he is indeed charismatic. Refraining from adultery would be evidence that he is charismatic, but to refrain for this reason would be irrational, since refraining does nothing to bring it about that he is charismatic. "The 'utility' of an act should be its genuine expected efficacy in bringing about states of affairs the agent wants, not the degree to which news of the act ought to cheer the agent" (Ibid., p. 140). The Newcomb problem, however, has the same structure as the case of Solomon. Hence, they conclude, one ought to take both boxes. According to David Lewis, one boxers are convinced by indicative conditionals: If I take one box, I shall be a millionaire; but if I take both boxes, I shall not. Two boxers readily admit the truth of these indicative conditionals, but insist that even if the Being is infallible, such that one knows that in taking two boxes he will receive only $1,000, still the rational course is to take both boxes. They take this stand because they are convinced by counterfactual conditionals: If I took only one box, I would be poorer by $1,000 than I shall be after taking both. Since the prediction and placement of the money is not conditioned by my choice, one cannot legitimately employ a back-tracking counterfactual instead of the foregoing normal counterfactual. When confronted with the taunt, "If you're so smart, why ain'cha rich?" Lewis retorts that two boxers are not rich because riches are reserved for the irrational (David Lewis, "'Why Ain'cha Rich?'," *Noûs* 15 [1981]: 377-80; so also Locke, "Newcomb Choice," p. 23). Cf. Doris Olin, "Newcomb's Problem, Dominance, and Expected Utility," in *Theoretical Foundations*, pp. 385-98; Daniel Hunter and Reed Richter, "Counterfactuals and Newcomb's Paradox," *Synthese* 39 (1978): 256-8.

13. Nozick, "Newcomb's Problem," p. 127.

14. Ibid., p. 132. On the irrelevancy of the prediction prior to the choice, see Robert E. Grandy, "What the Well-Wisher Didn't Know," *Australasian Journal of Philosophy* 55 (1977): 82-90; Andre Gallois, "How not to Make a New-

comb Choice," *Analysis* 39 (1979): 49-53; David Lewis, "Prisoner's Dilemma Is a Newcomb Problem," *Philosophy and Public Affairs* 8 (1979): 236-7. According to Lewis, it is "agreed all around" that what really matters is not the prediction's being made in advance, but its being causally independent of one's choice; this is especially evident in the Prisoner's Dilemma, which is a type of Newcomb Problem, for the prisoners' choices are merely independent, not temporally ordered. This insight seems very relevant to theological debates over the temporal necessity of divine foreknowledge, for this necessity would seem to amount only to the independence of God's foreknowledge and future free choices.

15. Nozick, "Newcomb's Problem," p. 134.

16. Alvin Plantinga, "Ockham's Way Out," *Faith and Philosophy* 3 (1986): 256.

17. J. L. Mackie, "Newcomb's Paradox and the Direction of Causation," *Canadian Journal of Philosophy* 7 (1977): 214, 223; Gregory S. Kavka, "What is Newcomb's Problem About?" *American Philosophical Quarterly* 17 (1980): 278; Bar-Hillel and Margalit, "Newcomb's Paradox," p. 299; Cargile, "Newcomb's Paradox," p. 237; Schlesinger, *Time*, p. 76.

18. Nozick, "Newcomb's Problem," p. 146.

19. Ahern, "Foreknowledge," p. 484.

20. G. Schlesinger, "The Unpredictability of Free Choices," *British Journal for the Philosophy of Science* 25 (1974): 209-21.

21. Schlesinger, *Time*, pp. 78-83.

22. David Lewis, "Counterfactual Dependence and Time's Arrow," *Noûs* 13 (1979): 456-57.

23. Lewis, "Rich," p. 377.

24. Lewis, "Prisoners' Dilemma," pp. 236-37. Like Nozick, Lewis uses the notion of causal influence very broadly. Since in the original paradox the being did not make his predictions based on precognition, Lewis points out that nothing I do now will have any effect on whether I get my million or not. Therefore, a backtracking counterfactual is impermissible. If we suppose that God's foreknowledge is determined by one's choice, however, Lewis's objection would no longer be relevant.

25. Terence Horgan, "Counterfactuals and Newcomb's Problem," *Journal of Philosophy* 78 (1981): 331-56.

26. Levi, "Newcombmania," p. 337.

27. See Richmond Campbell, "Introduction," in *Paradoxes*, p. 24. Levi does agree, however, that if the predictor is inerrant, then the one-box strategy is correct.

28. Terence Horgan, "Newcomb's Problem: A Stalemate," in *Paradoxes*, p. 224.

29. Ibid.

30. Campbell, "Introduction," p. 26.

31. Ellery Eells, "Causation, Decision, and Newcomb's Paradox," in *Paradoxes*, pp. 206-09.

32. Horgan, "Stalemate," p. 226.

33. Eells, "Newcomb's Paradox," p. 209-11.

34. Horgan, "Stalemate," p. 227.

35. Ibid., p. 234.

36. Steven J. Brams, *Superior Beings* (New York: Springer Verlag, 1983), pp. 46-52.

37. Cargile, "Paradox," p. 237.

## NOTES TO CHAPTER ELEVEN

1. Richard Taylor, "Deliberation and Foreknowledge," *American Philosophical Quarterly* 1 (1964): 73-80.
2. Ibid., p. 78. Also spotting Taylor's committing this modal fallacy is Bruce Reichenbach, "Omniscience and Deliberation," *International Journal for Philosophy of Religion* 16 (1984): 229; see also Robin Small, "Fatalism and Deliberation," *Canadian Journal of Philosophy* 18 (1988): 26.
3. Richard M. Gale, "Why a Cause Cannot be Later than its Effect," *Review of Metaphysics* 19 (1965-56): 233-34.
4. Richard R. LaCroix, "Omniprescience and Divine Determinism," *Religious Studies* 12 (1976): 365-81.
5. Ibid., pp. 372-73.
6. William J. Wainwright, *Philosophy of Religion: an Annotated Bibliography of Twentieth Century Writings in English* (New York: Garland Publishing, 1978), p. 100; Philip Quinn, "Divine Foreknowledge and Divine Freedom," *International Journal for Philosophy of Religion* 9 (1978): 225, 237.
7. So Wainwright, *Philosophy of Religion*, p. 101. Quinn argues that God could make decisions at the first moment of time, in which case there was no prior time at which He was undecided (Quinn, "Foreknowledge," pp. 230-1). But this, while technically correct, is not altogether satisfactory since there was a sort of priority of God's timeless eternity to the first moment of time which would serve LaCroix's purposes as well as a prior moment.
8. But see Chapter XIII for a middle knowledge perspective which does attribute deliberation to God logically prior to His decrees.
9. For a defense of the position that intentional action does not entail deliberation, see Reichenbach, "Omniscience and Deliberation," p. 230. For a brief response to Reichenbach, see David Basinger, "A Response to Reichenbach on Deliberation," *International Journal for Philosophy of Religion* 20 (1986): 169-72.

## NOTES TO CHAPTER TWELVE

1. Richard Swinburne, *The Coherence of Theism*, Clarendon Library of Logic and Philosophy (Oxford: Clarendon Press, 1977), p. 172. Cf. Osmond G. Ramberan, "Omniscience, Foreknowledge and Human Freedom," *Canadian Journal of Philosophy* 15 (1985): 483-88, who repeats the catchword of those who hold this view: ". . . at $T_1$ no one (not even God or Jones) can know what Jones will do at $T_2$ for the simple reason that there is *nothing yet to be known.*"
2. Anthony Kenny, *The God of the Philosophers* (Oxford: Clarendon Press, 1979), p. 58. It is not often appreciated that Kenny's quarrel with Ockham is not over theological fatalism. So far as Kenny's discussion goes, Ockham has successfully resolved that problem. Rather Kenny's difficulty is that Ockham does not explain the basis of divine foreknowledge. So also B. L. Hebblethwaite, "Some Reflections on Predestination, Providence and Divine Foreknowledge," *Religious Studies* 15 (1979): 438-44.
3. For a slightly different twist on the same argument, see Douglas P. Lackey, "A New Disproof of the Compatibility of Foreknowledge and Free Choice," *Religious Studies* 10 (1974): 313-18.
4. Both of these are suggested by Robert R. Cook, "God, Time, and Freedom," *Religious Studies* 23 (1987): 81-94.
5. See my discussion of Anselm, Aquinas, and Scotus's view in the companion volume to this book, *The Problem of Divine Foreknowledge and Future Con-*

*tingents from Aristotle to Suarez*, Studies in Intellectual History 7 (Leiden: E. J. Brill, 1988) and "St. Anselm on Divine Foreknowledge and Future Contingency," *Laval théologique et philosophique* 42 (1986): 93-104; also Delmas Lewis, "Eternity, Time, and Tenselessness," *Faith and Philosophy* 5 (1988): 72-86.

6. George B. Wall, "A New Solution to an Old Problem," *Religious Studies* 15 (1979): 513- 14.

7. Edward J. Khamara, "Eternity and Omniscience," *Philosophical Quarterly* 24 (1974): 212-18.

8. It is instructive, I think, to note how approvingly Swinburne treats Newton's perceptual model (Swinburne, *Theism*, pp. 166-7).

9. I leave aside the issue of propositions' changing their tenses as time progresses, for while this is relevant to divine immutability, it need have no bearing on God's foreknowledge so long as God knows all future-tense propositions at any time *t*.

10. Another alternative to these models would be to construe omniscience as a function of omnipotence, that is, God has the power to control His beliefs such that He only entertains true beliefs.

11. Hasker complains that such a response is unsatisfactory because we want to understand, not why God holds true beliefs *in general*, but *these particular* beliefs. Since it is not essential to Him to hold *these* beliefs, some further explanation is called for (William Hasker, critical notice of *The Only Wise God* by Wm. L. Craig, *Faith and Philosophy* 6 [1989]: 226). But the obvious answer to Hasker's question is that God holds these beliefs because they are *true*. He has an infallible and immediate intuition of truth, so that in any possible world God innately believes only and all the propositions which are true in that world.

12. Arthur N. Prior, "The Formalities of Omniscience," in idem, *Papers on Time and Tense* (Oxford: Clarendon, 1968), p. 36. So also Joseph Runzo, "Omniscience and Freedom for Evil," *International Journal for Philosophy of Religion* 12 (1981): 135-41. Similarly Matson objects to saying that God "just knows" the future, on the model of clairvoyance or telepathy. These are not models of *knowledge*, since ". . . whatever the analysis of knowing may be, it must at least include the having of good reasons for believing" (Wallace I. Matson, "An Introduction to Omniscience," *Analysis* 29 [1968-9]: 11). There can be, he concludes, no cognitive parallelism. Matson's perceptual model of omniscience leads him finally to pantheism.

13. Peter A. Streveler, "The Problem of Future Contingents: A Medieval Discussion," *New Scholasticism* 47 (1973): 243.

14. David Lewis, "Attitudes *De Dicto* and *De Se*," *Philosophical Review* 88 (1979): 513-43.

15. Ibid., p. 520.

16. Ibid., p. 521.

17. Patrick Grim, "Some Neglected Problems of Omniscience," *American Philosophical Quarterly* 20 (1983): 273-76.

18. In this connection, see the unfortunate piece by Richard E. Creel, "Can God Know that He Is God?" *Religious Studies* 16 (1980): 195-201. Creel says God cannot know that He is God because it is in principle impossible to know that one is immortal, beginningless, necessary, and omnipotent. All his arguments are based on the impossibility of making an inductive survey of an infinite number of data. But as Matson points out, "If there is an infinite number of things to be known, an [omniscient being] could not have learned them one by one, nor even (finite) group by group. Hence, if there is an o.b. . . . . knowing does not entail having learnt" (Matson, "Omniscience,"

p. 8). In God's knowing that He is omniscient, for example, God need not make any inductive investigation. For another example of the trivialization of philosophy of religion, see the tedious debate initiated by Roland Pucetti, "Is Omniscience Possible?" *Australasian Journal of Philosophy* 41 (1963): 92-93; also P. Ae. Hutchings, "Can We Say that Omniscience is Impossible?" *Australasian Journal of Philosophy* 41 (1963): 394-96; Roland Pucetti, "God, Omniscience, and Mr. Hutchings," *Australasian Journal of Philosophy* 42 (1964): 100-2; Fred Newman, "Omniscience is Possible," *Australasian Journal of Philosophy* 42 (1964): 102-3; Roland Pucetti, "Mr. Newman's View of Omniscience," *Australasian Journal of Philosophy* 42 (1964): 261. Pucetti's objection is that God cannot know the proposition that "There are no facts unknown to me" because He would have to know beyond the limits of His own knowledge in order to be sure there is nothing outside those limits. Again Pucetti seems to think of God's knowledge of facts as inductive, so that He could never be certain that there are not more. Such a conception is, however, erroneous: God simply has innate knowledge of this proposition as well as of all other true propositions. The real issue never addressed directly by Creel or Pucetti is whether God is justified in truly believing that He is God and that there are no facts unknown to Him. The lesson to be learned from these articles is that even if their objections were correct, the conclusions are so obviously absurd (imagine telling God that He cannot know that He is God!) that we should simply be obliged to revise our analysis of what constitutes knowledge.

19. See the helpful survey in Frederick Suppe, "Afterword-1977," in *The Structure of Scientific Theories*, 2d ed., ed. Frederick Suppe (Urbana: University of Illinois Press, 1977), pp. 716-28. According to Suppe, actual scientific practice, as revealed by recent work on objectivity and the growth of scientific knowledge, is at odds with the standard account of knowledge, and the most promising approach in supplying an adequate philosophical analysis of knowledge, including scientific knowledge, is the alternative which holds that in order to know $p$, one need not know that he knows $p$.

20. See Edmund Gettier, "Is Justified True Belief Knowledge?" *Analysis* 23 (1963): 121-23. On the connection with divine omniscience, see Grim, "Neglected Problems of Omniscience," pp. 265-66. Grim proposes "$x$ is omniscient" $=_{df}$ "For all $p$, $p$ is true iff $x$ believes that $p$, and $x$ believes that $p$ iff $x$ knows that $p$." Unfortunately, he never specifies what it is for $x$ to know that $p$.

21. Robert Nozick, *Philosophical Explanations* (Cambridge, Mass.: Belknap Press of Harvard University Press, 1981), pp. 172-78.

22. For a penetrating critique see Michael J. Costa, "Nozick's Tracking Theory of Knowledge," paper presented at the Western Division Meeting of the American Philosophical Association, April 26-28, 1984. Plantinga has also criticized Nozick's theory as a model for human knowledge, not because it is too stringent, but too lax. But notice that Plantinga's own model of knowledge in terms of proper functioning defined as "functioning as it was designed to" cannot serve as a model for God's knowledge, since God's noetic faculties were not designed. See Alvin Plantinga, *Warrant* (forthcoming).

23. Nozick, *Explanations*, p. 178.

24. Swinburne, *Theism*, pp. 169-76.

25. See also Kenny's critique of Lucas's account, which Swinburne endorses (Kenny, *God of the Philosophers*, pp. 60-61).

## NOTES TO CHAPTER THIRTEEN

1. For Molina's doctrine, see Luis Molina, *On Foreknowledge: Part IV of the "Concordia,"* trans. with Introduction and Notes by Alfred J. Freddoso (Ithaca, N.Y.: Cornell University Press, 1988). For an exposition of Molina's views, see William Lane Craig, *The Problem of Divine Foreknowledge and Future Contingents from Aristotle to Suarez,* Studies in Intellectual History 7 (Leiden: E. J. Brill, 1988), chap. 7.

2. For Suarez's doctrine, see R. P. Francisci Suarez, *Opera omnia,* ed. Carolo Berton, vol. 11: *Opuscula theologica sex materiam de auxiliis gratiae absolventia quaestionesque de scientia, libertate et justitia Dei elucidantia: Opusculum II: De scientia Dei futurorum contingentium* 2. 7. For an exposition of Suarez's views, see Craig, *Foreknowledge and Contingents from Aristotle to Suarez,* chap. 8.

3. The most frequently cited passages are II Samuel 23.6- 13; Matt. 11.20-4. These passages are not, however, decisive. The first passage could be explained on the basis of God's knowledge of the present character of Saul and the men of Keilah, so that He could reasonably surmise what they would do if David were to remain. The second passage is probably religious hyperbole, meant merely to underscore the depth of depravity of the cities in which Jesus preached. In any case, such passages would at most demonstrate counterfactual free knowledge in God, not middle knowledge.

4. See Diego Alvarez *De auxiliis divinae gratiae et humani arbitrii viribus, et libertate, ac legitima eius cum efficacia eorundem auxiliorum concordia* disp. 7. 1, 8. Similarly for modern Thomists; Michel asserts, "Certainly, the futurible exists in the divine knowledge, but it is determined there as such in virtue of a hypothetical decree of God's will, while the absolute future exists there in virtue of an absolute decree," and again: ". . . the mere fact of a knowledge in God having for its object the 'futurible' is a given and certain fact of theology which no one dreams of putting in doubt. The nerve of the discussion is this: are these futuribles known, in their very determination, before any decree—even simply hypothetical—of the divine will as to that very determination, or, rather, does their determination, even as simple futuribles, depend on the divine decree? The whole dispute is there!" *(Dictionnaire de théologie catholique s.v. "Science. II. Science de Dieu," by A. Michel, vol. 14. 2., cols. 1618, 1612.)* For a good example of the Thomist approach, see Hippolyte Gayraud, *Thomisme et Molinisme,* 2 vols., vol. 1: *Critique du Molinisme* (Toulouse: Librairie Edouard Privat, 1890), pp. 29-31; ibid., vol. 2: *Providence et libre arbitre* (Toulouse: Librairie Edouard Privat, 1892), pp. 90-1.

5. A point argued, for example, by David Basinger, "Middle Knowledge and Classical Christian Thought," *Religious Studies* 22 (1986): 407-22. I assume here a libertarian view of freedom. If one adopts a Thomistic model of theological determinism, then, as Thomas Flint points out, since the circumstances into which God places creatures include His acts of intrinsically efficacious grace and premotions of the creaturely will, His knowledge of counterfactuals becomes part of His natural, not free, knowledge. (Thomas P. Flint, "Two Accounts of Providence," in *Divine and Human Action,* ed. T. V. Morris [Ithaca, N.Y.: Cornell University Press, 1988], pp.147-181). But such a doctrine saves providence only at the sacrifice of creaturely freedom.

6. This is not exactly correct; see discussion on pp. 266-7.

7. Thus, the view expressed by Robert R. Cook, "God, Time and Freedom," *Religious Studies* 23 (1987): 93, that God acquired knowledge of the spatio-temporal universe only at the moment of creation, so that "Before the act of

creation he was ignorant of the outcome, while since then, he has known the
end from the beginning of this cosmos" is unacceptable.

8. See Donald A. Carson, *Divine Sovereignty and Human Responsibility*, New
Foundations Theological Library (Atlanta: John Knox Press, 1981), pp. 18-
35. For a discussion see William Lane Craig, *The Only Wise God: The Com-
patibility of Divine Foreknowledge and Human Freedom* (Grand Rapids, Mich.:
Baker, 1987), chaps. 1, 2.

9. See Robert Shank, *Life in the Son*, 2d ed. (Springfield, Missouri: Wescott,
1973) and I. Howard Marshall, *Kept by the Power of God*, 2d ed. (Minneapolis:
Bethany Fellowship, 1974). For a Molinist view, see my "'Lest Any Should
Fall': A Middle Knowledge Perspective on Apostasy and Apostolic Warnings,"
(forthcoming).

10. For an interesting proposal, see Robert Shank, *Elect in the Son* (Springfield,
Missouri: Wescott, 1970). For a theological discussion, see my "Middle Knowl-
edge: a Calvinist- Arminian Rapprochement?" in *The Grace of God, the Will
of Man*, ed. Clark Pinnock (Grand Rapids, Mich.: Zondervan, 1989).

11. For an irenic discussion of Thomas and Molina, see Gerard Smith, *Freedom
in Molina* (Chicago: Loyola University Press, 1966), chaps. 3, 4, 5, 7. For a
contrasting view, see Blaise Romeyer, "Libre arbitre et concours selon Molina,"
*Gregorianum* 23 (1942): 169-201; see also George Hayward Joyce, *Principles of
Natural Theology*, Stonyhurst Philosophical Series (London: Longmans, Green,
& Co., 1923), pp. 353-71, 537-55.

12. See *Dictionnaire de théologie catholique*, s.v. "Science. II. Science de Dieu,"
vol. 14.2., cols. 1613-18.

13. Gayraud, *Thomisme et Molinisme*, 1: 29-57.

14. Ibid., 1: 60-83.

15. Robert Merrihew Adams, "Middle Knowledge and the Problem of Evil," *Ame-
rican Philosophical Quarterly* 14 (1977): 109; cf. idem, "Plantinga on the
Problem of Evil," in *Alvin Plantinga*, ed. James Tomberlin and Peter Van
Inwagen, Profiles 5 (Dordrecht, Holland: D. Reidel, 1985), p. 232: "I believe
that counterfactuals of freedom cannot be true."

16. Adams, "Middle Knowledge," p. 110.

17. Ibid.; surely the word "it" is missing from this quotation before the "is," for
it would not make sense to say that one must negate the entire conditional to
negate the consequent.

18. Ibid., p. 115.

19. Ibid.

20. Ibid., p. 116.

21. Alvin Plantinga, "Reply to Robert Adams," in *Alvin Plantinga*, p. 380.

22. Kvanvig also objects to Adams's formulation because there are cases in which
it is inappropriate. For example, if I were to claim, "If my car were wrecked, I
would get angry," and in fact my car is wrecked, but I do not get angry, then
we should be justified in saying that my claim was false: it was not true that
if my car were wrecked, I would get angry. But on Adams's construal, the
counterfactual claim could still be true, since the consequent is only probable
(Jonathan Kvanvig, *The Possibility of an All-Knowing God* [New York: St.
Martin's Press, 1986], p. 138). See also a brief critique of Adams by Richard
Otte, "A Defense of Middle Knowledge," *International Journal for Philosophy
of Religion* 21 (1987): 161-69.

23. Kvanvig, for example, responds to the present objection, ". . . the failure of
the law of CEM would undermine our account only if the law fails regarding
conditionals with maximally specified antecedents . . . . What must be
shown, instead of that law of CEM being false, is that the law is false regarding
maximally specified antecedents" (Kvanvig, *All-Knowing God*, pp. 146-47).

24. Thomas P. Flint and Alfred J. Freddoso, "Maximal Power," in *The Existence and Nature of God*, ed. Alfred J. Freddoso (Notre Dame, Ind.: University of Notre Dame Press, 1983), p. 96. Flint and Freddoso seem willing to defend an even stronger statement, remarking that for counterfactuals having antecedents of the form "individual essence $P$ is instantiated in circumstances $C$ at time $t$, and $P$'s instantiation is left free with respect to action $A$," where the substituend for "$C$" must be a complete description of the past at $t$ along with a clause specifying that the same laws of nature continue to hold at $t$, then for *any* proposition $q$, either $p \, \square\!\!\rightarrow q$ or $p \, \square\!\!\rightarrow \sim q$ (ibid., pp. 111-12). But I do not see that this extra stipulation warrants their stronger statement. Consider the following counterfactual: "If Suarez were sitting at his desk in $C$ at 9:00 a.m., April 1, 1588, and was free with respect to scratching his beard, then at 4:00 p.m., April 1, 1988, Freddoso would scratch his head." This counterfactual may be true or false, but I fail to see why it is more plausibly thought to be so under the new stipulation as opposed to a simple appeal to the Law of Conditional Excluded Middle.

25. Adams, "Middle Knowledge," p. 112.

26. See, for example, J. L. Mackie, *Truth, Probability, and Paradox* (Oxford: Clarendon Press, 1973), chap. 3; Lewis G. Creary and Christopher S. Hill, review of *Counterfactuals, Philosophy of Science* 42 (1975): 341-4; Kit Fine, review of *Counterfactuals, Mind* 84 (1975): 451-8; William T. Parry, review of *Counterfactuals, Journal of Symbolic Logic* 44 (1979): 278-81; Jonathan Bennett, "Counterfactuals and Possible Worlds," *Canadian Journal of Philosophy* 4 (1974): 381-402; Michael A. Slote, "Time in Counterfactuals," *Philosophical Review* 87 (1978): 3-27; Wayne A. Davis, "Indicative and Subjunctive Conditionals," *Philosophical Review 88* (1979): 544-64; David Lewis, "Counterfactual Dependence and Time's Arrow," *Noûs* 13 (1979): 455-76; Charlie B. Daniels and James B. Freeman, "An Analysis of the Subjunctive Conditional," *Notre Dame Journal of Formal Logic* 21 (1980): 649-55; Jonathan Bennett, "Counterfactuals and Temporal Direction," *Philosophical Review* 93 (1984): 57-91.

27. Alvin Plantinga, *The Nature of Necessity*, Clarendon Library of Logic and Philosophy (Oxford: Clarendon Press, 1974), pp. 176-8; cf. Kvanvig, *All-Knowing God*, p. 145. The superficial critique of Joshua Hoffman, critical notice of *The Possibility of an All-Knowing God*, by J. Kvanvig, *Faith and Philosophy* 6 (1989): 231, is answered implicitly in the text.

28. Cf. Plantinga, "Reply to Adams," p. 378.

29. Plantinga, *Nature of Necessity*, p. 179.

30. Plantinga, "Reply to Adams," p. 378.

31. Adams, "Plantinga," p. 232. Cf. Bruce Reichenbach, "Fatalism and Freedom," *International Philosophical Quarterly* 28 (1988): 276-78, whose objections are answered implicitly in the text. See also helpful discussion of this issue by Freddoso, "Introduction," pp. 68-75.

32. Plantinga, "Reply to Adams," p. 374.

33. Ibid., p. 375.

34. Ibid., p. 374.

35. Anton C. Pegis, "Molina and Human Liberty," in *Jesuit Thinkers of the Renaissance*, ed. Gerard Smith (Milwaukee: Marquette University Press, 1939), p. 128.

36. Smith, *Freedom in Molina*, pp. 141-42; cf. Gerard Smith, *Natural Theology: Metaphysics II*, Christian Wisdom Series (New York: Macmillan Co., 1951), p. 277.

37. Adams, "Plantinga," p. 232.

38. Adams, "Middle Knowledge," p. 113.

39. Plantinga, "Reply to Adams," p. 376.
40. See David Lewis, *Counterfactuals*, Library of Philosophy and Logic (Oxford: Basil Blackwell, 1973), p. 4.
41. Anthony Kenny, *The God of the Philosophers* (Oxford: Clarendon Press, 1979), pp. 68-9.
42. Plantinga, *Nature of Necessity*, p. 169.
43. See also Kvanvig's analysis:

> "Kenny's objection rests on a simple confusion. He claims that what an account like mine must posit is that there are true subjunctives of freedom before the actualization of any world by God. The confusion is that it is simply not possible that there is no actual world; though it is possible that the actual world is one in which God has not (yet) created anything. But that is quite a different matter from there being no world at all. Kenny wishes to claim that subjunctives in question lack a truth value until some world is actual. That can be granted; without an actual world, there would be no truths at all. All that shows, however, is that it is not possible that there fails to be an actual world . . . ."

On Kvanvig's view, counterfactuals of freedom are included in individual essences. Since these exist "prior" to God's creative decree, counterfactuals of freedom are then already true or false. Kvanvig's move of including such counterfactuals in essences is problematic, it seems, for then God should know the true counterfactuals included in His essence, which undermines divine freedom, as we shall see. But such a move would not remove creaturely freedom, as alleged by Reichenbach, "Fatalism and Freedom," p. 278, for counterfactuals of creaturely freedom are only contingently true.

44. See Suarez *De scientia Dei* 2. 7. 6.
45. Adams, "Middle Knowledge," p. 111.
46. Ibid., p. 112.
47. Thomas Aquinas *Summa theologiae* 1a. 14. 8. For an account see Craig, *Foreknowledge and Contingents from Aristotle to Suarez*, chap. 4.
48. R. Garrigou-Lagrange, *Dieu: Son existence et sa nature*, 2 vols., 11th ed. (Paris: Beauchesne, 1950), 2: 407. For d'Ales's views, see A. d'Ales, *Providence et libre arbitre* (Paris: Gabriel Beauchesne, 1927), pp. 19-20, 91-5.
49. Garrigou-Lagrange, *Dieu*, 2: 863-4. Cf. R. P. Phillips, *Modern Thomistic Philosophy*, 2 vols., vol. II: *Metaphysics* (Westminster, Maryland: Newman Press, 1964), p. 325.
50. See William Lane Craig, *The Cosmological Argument from Plato to Leibniz*, Library of Philosophy and Religion (London: Macmillan, 1980), pp. 160-75.
51. See Smith, *Freedom in Molina*, p. viii. Smith explains that it is the constant assertion of Catholic dogma that salvation is the work of God and man. There are three elements in salvation: grace, the supernatural act, and glory. The first causes the second, which causes the third. Man has no right to God's grace, which is given freely to man. By good use of God's grace, man performs certain supernatural acts. By the merit of these acts, he secures glorification. God thus begins the work of salvation without man, continues it with man, and finishes it because of man. Yet in this entire process, man is free.

The point I am making is that on a Molinist view (which Smith rejects), the supernatural acts are at best only instigated by God, but wrought by man himself, thus leading to salvation by human works. A Christian would therefore seem compelled to choose either Thomism or Protestantism.

52. In fact, in defending the Thomist view against determinism, Garrigou-Lagrange at one point asserts, "God certainly does not impose on our liberty a determination *ad unum* which would not come from ourselves . . . ." (Garrigou-Lagrange, *Dieu*, 2: 798), an assertion which sounds very much like the view

that God, knowing by middle knowledge what certain creatures would freely do, then causally determines them to do it! See also Joyce's remarks on divine concurrence in *Natural Theology*, pp. 537-55. A very provocative theory of divine providence might be had through a wedding of middle knowledge with a Frankfurtian analysis of freedom (Harry Frankfurt, "Alternate Possibilities and Moral Responsibility," *Journal of Philosophy* 66 [1969]: 829-39).

53. So also William J. Wainwright, *Philosophy of Religion*, Wadsworth Basic Issues in Philosophy Series (Belmont, Cal.: Wadsworth Publishing Co., 1988), p. 28.

54. I do not wish to defend this assertion here, though such a procedure will be highly unsatisfactory to Thomists. But my purpose is not to refute Thomism, but merely to inquire whether Molinism is a viable alternative. For an irenic discussion of this issue, see Flint, "Two Accounts of Providence," pp. 147-81.

55. See Flint and Freddoso, "Maximal Power," pp. 93-8. See also Thomas P. Flint, "The Problem of Divine Freedom," *American Philosophical Quarterly* 20 (1983): 255-64, which is a revised excerpt from Thomas P. Flint, "Divine Freedom," (Ph.D. dissertation, University of Notre Dame, 1980).

56. Flint and Freddoso, "Maximal Power," p. 95. I have found it necessary to add the phrase "in $C$" to (20) and (21), for otherwise God could, for example, despite the truth of (23) actualize (21) by altering the circumstances in some way. The authors acknowledge their indebtedness to Plantinga for this argument (Plantinga, *Nature of Necessity*, pp. 180-84), but more recently he appears to charge a similar argument with the counterfactual fallacy of strengthening the antecedent (Plantinga, "Reply to Adams", pp. 372-73). He himself points out, however, a valid form of the argument for the same conclusion. Letting $w$ stand for any possible world which God could weakly actualize and $Tw$ for the largest state of affairs strongly actualized by God in $w$, Plantinga first proves that if God were to strongly actualize $Tw$, then $w$ would be actual. Let $w$ include Jones's freely deciding in $C$ at $t$ to write to his wife. Now $Tw$ does not include Jones's deciding in $C$ at $t$ to write to his wife; otherwise Jones's decision would not be free. Accordingly, there is another world $w^*$ in which God strongly actualizes the same states of affairs as in $w$ and yet Jones decides to refrain. So, given that $Tw=Tw^*$, it is within God's power to weakly actualize each of $w$ and $w^*$ only if both "God actualizes $Tw \;\square\!\!\rightarrow\; w$" and "God actualizes $Tw \;\square\!\!\rightarrow\; w^*$" are true. But since $w$ and $w^*$ are mutually exclusive, both of the counterfactuals can be true only if God's actualizing $Tw$ is impossible. But *ex hypothesi* this state of affairs is possible. Hence, either $w$ or $w^*$ is such that it is not within God's power to actualize (Plantinga, "Self-Profile," pp. 49-52).

57. Michel Ledrus, "La science divine des actes libres," *Nouvelle revue théologique* 56 (1929): 134-5.

58. For a different sort of attempt to show that middle knowledge is destructive of human freedom, see William Hasker, "A Refutation of Middle Knowledge," *Noûs* 20 (1986): 545-57. His argument, however, is vitiated by the fact that from the truth of his

> 12. If Elizabeth does not accept the offer, it will be because the offer was not made,

one may not infer the truth of his

> 9. If Elizabeth were not to accept the grant, it would be true that if she were offered the grant, she would accept it.

It is entirely possible that (12) be true and (9) false. Moreover, Hasker is wrong that if his

> 1. If Elizabeth were offered the grant, she would accept it

is true in the actual world, then it is also true in the (12) world. In any case, Hasker's counterfactuals are not in the proper form for counterfactuals of freedom, so that the proponent of middle knowledge could simply deny that they are true or false, since they are not well-formed. For a critique of Hasker, see Freddoso, "Introduction," pp. 75-78. For further discussion of Hasker's "power entailment principles," see David Basinger, "Middle Knowledge and Human Freedom," *Faith and Philosophy* 4 (1987): 330-36 and William Hasker, "Reply to Basinger on Power Entailment," *Faith and Philosophy* 5 (1988): 87-90.

59. Flint, "Divine Freedom," pp. 256-58; Flint and Freddoso, "Maximal Power," pp. 96-98.

60. For further discussion of the theological ramifications of the doctrine of middle knowledge, see Craig, *Foreknowledge and Contingents from Aristotle to Suarez*, chaps. 7, 8; idem, "Middle Knowledge: a Calvinist-Arminian *Rapprochement*?"; idem, "'No Other Name': a Middle Knowledge Perspective of the Exclusivity of Salvation through Christ," *Faith and Philosophy* 6 (1989): 172-88, idem, "'Lest Anyone Should Fall'," (forthcoming).

## NOTES TO APPENDIX

1. Hilary Putnam, "Time and Physical Geometry," *Journal of Philosophy* 64 (1967): 240-47.
2. My diagram is based on that of C.W. Rietdijk, "A Rigorous Proof of Determinism Derived from the Special Theory of Relativity," *Philosophy of Science* 33 (1966): 341 for the sake of continuity of our discussion.
3. Putnam, "Time and Physical Geometry," p. 244.
4. Robert Weingard takes issue with Putnam's argument because simultaneity relations for events having a space-like separation are purely conventional. Any event at some spacetime point outside of the light cone of any point $P$ can be construed as simultaneous with $P$. But this provides, states Weingard, the means for a successful reformulation of Putnam's argument. For any event which can be considered simultaneous with $P$ must be real in relation to $P$. Therefore, if I am now at $P$, I should conclude that any event outside my light cone is real. This result can be easily generalized so that all events in spacetime must be considered real (Robert Weingard, "Relativity and the Reality of Past and Future Events," *British Journal for the Philosophy of Science* 23 [1972]: 119-21).
5. D. H. Mellor, "Special Relativity and Present Truth," *Analysis* 34 (1973-74): 75-76.
6. Ibid., p. 75.
7. Putnam, "Time and Physical Geometry," p. 247.
8. See, for example, Milic Capek, "Introduction," *The Concepts of Space and Time*, ed. M. Capek, Boston Studies in the Philosophy of Science 22 (Dordrecht: D. Reidel, 1976), p. XLVI; G. J. Whitrow, *The Natural Philosophy of Time*, 2d ed. (Oxford: Clarendon Press, 1980); p. 350; Frederick Ferré, "Transiency, Fate, and the Future," *Philosophical Forum* 2 (1971): 388-94; Nicholas Maxwell, "Are Probabilism and Special Relativity Incompatible?" *Philosophy of Science* 52 (1985): 23-43; Aloys Wenzl, "Einstein's Theory of Relativity, Viewed from the Standpoint of Critical Realism, and its Significance for Philosophy," in *Albert Einstein: Philosopher-Scientist*, ed. Paul Arthur Schilpp, Library of Living Philosophers 7 (LaSalle, Ill.: Open Court, 1949), p. 589.
9. Rietdijk, "Proof of Determinism," p. 341. Rietdijk's article is marred by the confusion between "determinism" and "fatalism" and between "determined" and "determinate."

10. Ibid., p. 342.
11. Ibid.
12. Ibid., p. 343.
13. John D. Sinks, "On Some Accounts about the Future," *Journal of Critical Analysis* 2 (1971): 8-16.
14. Ibid. Cf. the inadequate treatment of the issue by Yemima Ben-Menahem, "Free Will and Foreknowledge," *Philosophical Quarterly* 38 (1988): 486-90, who shows merely that STR does not imply causal determinism.
15. This distinction was carefully drawn by Newton himself in the *Scholium* to the Definitions at the beginning of his *Principia* (Isaac Newton, *Sir Isaac Newton's 'Mathematical Principles of Natural Philosophy' and his 'System of the World,'* trans. Andrew Motte, rev. with an Appendix by Florian Cajori, 2 vols. [Los Angeles: University of California Press, 1966], 1: 6-12). Newton could admit quite happily that he was wrong about physical time in failing to appreciate the relativistic effects of uniform motion upon clocks without in any way compromising his commitment to metaphysical time or absolute simultaneity, since he freely admitted that our physical clocks do not record ontological time even on Newtonian theory. It was Einstein's positivism, not his discovery of physical relativity, that spelled the end for Newton's metaphysical time. For a similar distinction between metaphysical and physical time, see Mary F. Cleugh, *Time and its Importance in Modern Thought,* with a Foreword by L. Susan Stebbing (London: Methuen, 1937), pp. 29-67; Philipp Frank, *Philosophy of Science* (Englewood Cliffs, N.J.: Prentice Hall, 1957), pp. 140-43; Herbert Dingle, "Time in Philosophy and Physics," *Philosophy* 54 (1979): 99-104; Peter Kroes, *Time: Its Structure and Role in Physical Theories,* Synthese Library 179 (Dordrecht: D. Reidel, 1985), p. xiii; Alan Padgett, "God and Time: Toward a New Doctrine of Divine Timeless Eternity," *Religious Studies* 25 (1989): 209-15.
16. See Albert Einstein, "On the Electrodynamics of Moving Bodies," trans. Arthur I. Miller, in Arthur I. Miller, *Albert Einstein's Special Theory of Relativity* (London: Addison-Wesley, 1981), pp. 392-96. For a discussion of Einstein's positivism, see Gerald Holton, "Mach, Einstein, and the Search for Reality," in *Ernst Mach: Physicist and Philosopher,* Boston Studies in the Philosophy of Science 6 (Dordrecht: D. Reidel, 1970), pp. 167-77; Philipp Frank, "Einstein, Mach, and Logical Positivism," in *Albert Einstein: Philosopher-Scientist,* ed. P.A. Schilpp, Library of Living Philosophers 7 (LaSalle, Ill.: Open Court, 1949), pp. 271-86; H. Reichenbach, "The Philosophical Significance of the Special Theory of Relativity," in *Albert Einstein,* pp. 289-311; Lawrence Sklar, "Time, reality and relativity," in *Reduction, time and reality,* ed. R. Healey (Cambridge: Cambridge University Press, 1981), pp. 132, 141.
17. This I take to be the solution of Howard Stein, "On Einstein-Minkowski Space-Time," *Journal of Philosophy* 65 (1968): 5-23, and Milic Capek, "The Inclusion of Becoming in the Physical World," in *Concepts of Space and Time,* pp. 501-24. Stein's view seems to be that there is no knife-edge of becoming, even for local frames, but rather pinpoints of becoming determined by the vertex of any observer's past light cone. See also Tobias Chapman, "Special Relativity and Indeterminism," *Ratio* 15 (1973): 107-10; K.G. Denbigh, "Past, Present, and Future," in *The Study of Time III,* ed. J. T. Fraser, N. Lawrence, and D. Park (Berlin: Springer Verlag, 1978), pp. 307-29.
18. It seems to imply a sort of relativistic solipsism, as is pointed out by Sklar, "Time, reality and relativity," p. 140.
19. This I take to be the position of Whitrow, *Natural Philosophy of Time,* pp. 283-307, 371.

20. Arthur Eddington, *Space, Time and Gravitation*, Cambridge Science Classics (Cambridge: Cambridge University Press, 1920; rep. ed.: 1987), pp. 34-36.
21. P. C. W. Davies, "Space-Time Singularities in Cosmology and Black Hole Evaporations," in *Study of Time III*, p. 76. I have corrected the spelling mistakes in the citation.
22. Eddington, *Space, Time and Gravitation*, p. 168.
23. Paul Fitzgerald, "The Truth about Tomorrow's Sea Fight," *Journal of Philosophy* 66 (1969): 326.

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